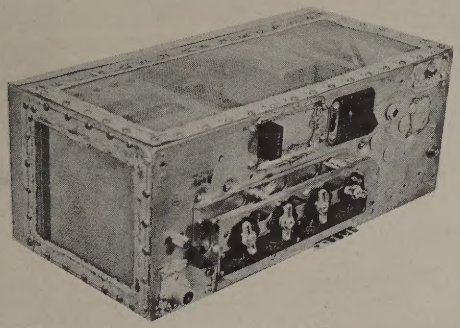
BC-625 ON 2 METERS



BC-625 TRANSMITTER with T.V.I. shielding in place

CONVERSION INSTRUCTIONS FOR RADIO TRANSMITTER BC-625-A
A PART OF RADIO SET SCR-522-A, TO OPERATE IN THE 144-
148 M.C. AMATEUR BAND.

Remove the transmitter from rack FT 244-A.

Remove all tubes. Be careful with both VT 118 tubes.

Unsolder all leads from plug 123-1. Unsolder all leads from relay 130. Remove relay 130.

Cut the lacing of the cables going to all three relays.

Unsolder the leads to relay 161 and remove it. Unsolder the leads to relay 131 and remove it.

Now most of the cabled wires to the relays are free and may be removed, including the two wires going through the chassis to the under side.

Remove the shielded wire from pin 3 of VT 134 to the 500k ohm resistor 140-2. Do not remove the shielded wire to transformer 160.

Disconnect the jumper between 138-3 and 140-3.

If desired, components 140-3, 140-2, 108-2, 140-4, 142, and 105-3 may be removed.

The small terminal board having four 1-Meg. resistors (141-1, 141-2, 141-3, 141-4), and two .006 Mfd. capacitors (102-14, 102-15) mounted on it may be removed. Remove the yellow lead going to pin 6 of plug 123-2. Remove the black lead with green tracer going to pin 5 of plug 123-2.

CHANGES IN THE MODULATOR

The gain of the 6SS7 speech amplifier stage was originally held down by using low screen voltage, and high bias.

Paralell the 1Meg. ohm resistor (138-3) with another 1 Meg. resistor 1 watt. Change the 2k ohm cathode bias resistor (153-3) to one of 470 ohm 2 watt.

Remove plug 123-1. Break off the mounting ears by bending back and forth. Cover the hole left by removal of plug 123-1 with a small metal plate, using machine screws and solder to fasten the plate. An appropriate jack to accommodate the microphone plug may be mounted on this plate.

The original microphone was an electromagnetic type or 'dynamic' (low impedance type. 200 ohm) microphone. A two button carbon microphone could be used, connecting the buttons to the yellow and green leads of the shielded wire lead coming up into the modulator compartment from transformer 158.

MODIFICATION TO USE A SINGLE CIRCUIT DYNAMIC TYPE MICROPHONE WILL BE DESCRIBED:

Disconnect terminal 2 of transformer 158 from ground. Ground terminal 1 of this transformer. Do not disconnect the yellow wire. Connect the free end of the green wire to the ungrounded terminal of the microphone jack. Connect the free end of the yellow wire and the shield lead to the grounded terminal of the jack. The green lead going to the center terminal of the gain control is a short one coming out of a hole in the metal tubing about 2½" down from the top.

Replace this lead with a wire long enough to go down through the tubing underneath the chassis to the 2k ohm resistor that goes to pin 4 of the 6SS7. Be sure the metal tubing is securely fastened to the chassis for mechanical reasons as well as for grounding.

Be sure that the normally grounded side of the gain control is grounded.

Ground terminal 4 of transformer 158, if it is not already grounded.

For convenience of metering, a standard opencircuit phone jack was mounted in one of the holes of the panel above the VT134-A modulator tubes. This must be done using insulating washers, as the B+ 300 volts is on the jack. Two wires are then run through the partition and connected to the terminals of the pins of the original metering plug.

The metering is done with a 1 M.A. Meter, and typical readings are as follows:

1-----.6-.8
2-----.5
3-----.5 unloaded .65 loaded
4-----open
5-----tune for max. (P.A. grid mils. full scale o.k.)
6-----open

MODIFICATIONS OF THE R.F. SECTION

Since the unit originally covered a range of 100-156 M.C., the tuning capacitors are much too large for convenient tuning over the smaller range.

Plates were stripped from the stators of all four tuning capacitors. This may be accomplished by using long nose pliers.

Grasp the plate close to where it is soldered to a tie bar, and then twist. This tears the plate free and then it may be pulled out.

The tuning condenser for the plate tank of the 6G6G was stripped until only one stator plate on each side was left.

The tuning condenser for the 12A6 plate tank was stripped until two stator plates on each side were left.

The tuning condensers for the plate tanks of both the 832'S were stripped until one stator plate on each side was left.

No coil changes were found necessary.

MODIFICATION OF THE FREQUENCY SHIFTER SLIDE MECHANISM

If no slide mechanism is received as part of the unit, couplings to extend the variable condenser shafts may be used. These should be of the reducing type to go from ¼" shaft to 5/32" shaft.

The slide mechanism may be removed as follows:

Obtain the correct size 'Bristo' wrench to loosen the set screws of the couplings between the mechanism and the variable condensers.

Use a hot soldering iron to soften the cement sealing the set screws. Loosen the set screws. Remove the machine screws holding the mechanism to the front panel. Remove the wing nuts and dial pointers.

The slide mechanism may now be removed. It will now be seen that the slide mechanism may be disassembled by removing four 6-32 nuts. This will leave the rear plate with only the four tuning shafts protruding. Remove all the 'dog's and washers from the shafts. Remove the slide shifters from the front portion.

Remove the four gang wafer switch. Re-assemble the frame of the slide shifter, and replace. The frame is necessary to provide support for the tuning shafts.

The dial pointers and wing nuts may now be replaced. Tighten the wing nuts to provide a small amount of friction for the tuning condenser shafts, and add a lock nut to each.

Since the four gang wafer switch is no longer needed, it may be removed. The original purpose of the switch was to switch crystals.

After removal of the switch, the white lead wire from pin #5 of VT 198-A must be connected to the ungrounded side of the crystal socket 'D'.

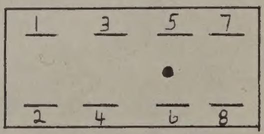
The others may have their ungrounded leads disconnected, and removed.

POWER SUPPLIES

To put the unit into operation, a power supply capable of 200 M.A. @ 300 volts, 12 volt heater supply @ 1.5 amps., and a bias supply capable of 150 volts @ 25 M.A. are necessary. The bias supply preferably should be regulated.

If the power transformer has a reserve of 20 M.A. or so, it may be used to obtain the negative bias voltage by connecting a second rectifier tube 'backwards'. The rectifier must be of the indirectly heated type such as a 6x5, or a separate filament winding must be provided. A transformer having a multi-tapped secondary is most convenient for use with this method of obtaining bias.

POWER PLUG CONNECTIONS



TERMINAL#	CONNECTION
1-----------	-150 V.
2-----------	12 V. hot
3-----------	+ 300 V.
4-----------	+ 300 V.
5-----------GND-	+ 150 V.
6----------- "	" " "
7----------- "	" " "
8----------- "	" " "

If, upon putting the unit into operation, the final grid mils seem too low, (less than 1 M.A.) the following things may be done to increase drive to the final:

The two 832'S have no external screen by-pass capacitors in the original unit. It was found that more final amplifier grid current was obtained when each 832 had its screen by-passed to its locating pin at the socket, as closely as possible. A 500 MMF ceramic disc capacitor should be used.

Additional grid current may be obtained by inserting a 2½ mh R.F. choke between the 50k ohm grid resistor and the grid terminal of the 12A6 tripler. Also remove the 50 ohm resistor from between the coupling capacitor to the 6G6G plate and the grid of the 12A6.

T.V.I. ELIMINATION

Shields were made for all four open slides of the unit using bronze or copper screen wire. Pieces were cut to fit the slides, and all the edges of the screen were soldered to strips of galvanized sheet iron about 5/8" wide. These strips made frames for all the shield panels. A continuous strip of solder was run around all edges of the frames to insure solid grounding of each wire in the screen.

These panels were next drilled at 1" intervals all around the edges to pass small metal screws.

Corresponding holes were drilled into the frame of the transmitter, using care to see that no components received any damage.

Metal screws were used to fasten the shields onto the sides. These made a very R.F. tight shield for the sides. The copper screen is next to the chassis.

A bottom shield was made of sheet aluminum by bending ½" lips up on all four sides. This too should be fastened by drilling holes at 1" intervals, and using metal screws.

All openings in the front (or top) panel are covered as much as possible.

The opening for the four crystal sockets is mostly covered using a small piece of sheet metal, and soldering around the edges. A hole just large enough for one crystal is left over crystal socket 'D'.

A small piece of sheet metal is used to cover the original antenna jack opening, using metal screws and solder. A standard co-axial chassis fitting is installed in this cover directly over the original 'hot'antenna jack. A heavy piece of copper wire is soldered into the co-axial fitting prior to mounting it. This wire then passes down through the original jack, and is soldered to the jack connection.

All wires (except ground) are removed from between plug 123-2 and their first tie points. Each wire is replaced using shielded wire.

Ground the shielded wires at both ends using short heavy leads, or soldering directly. Also, ground at any convenient points in between.

By-pass the shielded wires at each end to ground, using .005 MF. Disc ceramic capacitors. Make the capacitor leads as short as possible.

Make or obtain a small metal cover for plug 123-2, to be installed over the inside terminals of the plug. This cover must be securely fastened and heavily grounded, preferably by soldering. Use any necessary insulation inside the cover.

Prior to installation of the cover, terminals 5,6,&7 should be grounded using copper strip.

The leads to the meter jack should receive the same kind of treatment, and a metal cover be installed over the jack and capacitors just as was the power plug 123-2.

The microphone jack should have a 1 M.H. R.F. choke installed in series with the ungrounded lead directly at the jack. By-pass the jack to ground on both sides of the choke using .0005 M.F. disc ceramic capacitors. Make the capacitor leads as short as possible. Place a metal cover over the jack and the choke and capacitors. Be sure the cover is heavily grounded. The lead wire is already shielded.

These procedures will almost completely eliminate T.V.I. even in 'fringe' areas. It may be necessary to use a high pass filter in the antenna lead having a cut off frequency of approximately 100 M.C. for perfect suppression.

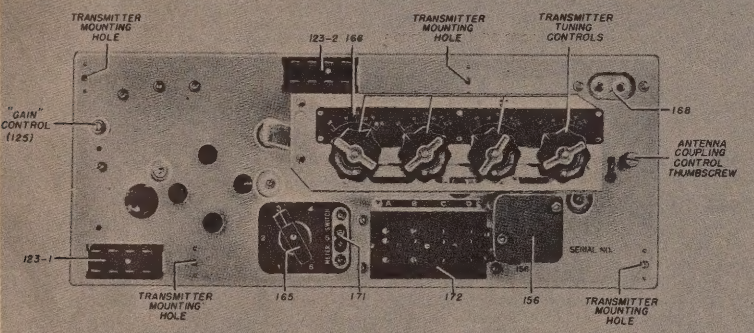

TRANSMITTER MOUNTING HOLE
123-2
166
TRANSMITTER MOUNTING HOLE
TRANSMITTER TUNING CONTROLS
168
"GAIN" CONTROL (125)
ANTENNA COUPLING CONTROL THUMBSCREW
A B C D
SERIAL NO.
123-1
TRANSMITTER MOUNTING HOLE
165
171
172
156
TRANSMITTER MOUNTING HOLE

Figure 31 — Radio Transmitter BC-625-A, Top View

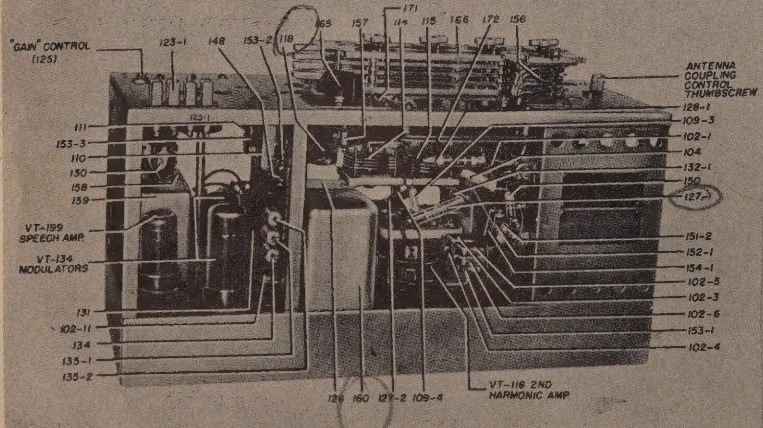


Figure 32 — Radio Transmitter BC-625-A, Front View

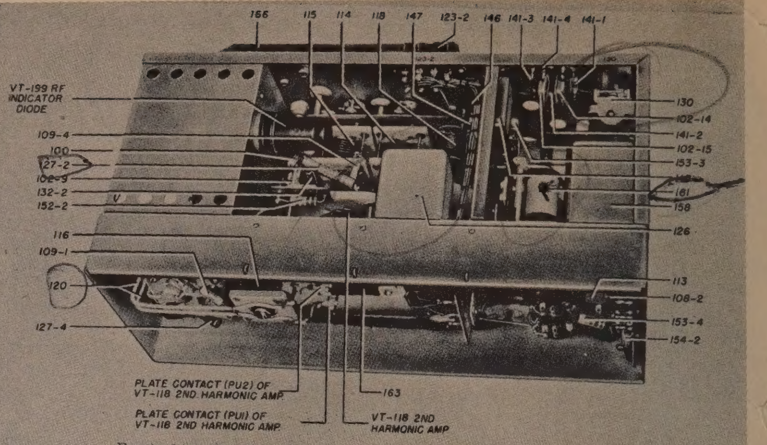


Figure 34 — Radio Transmitter BC-625-A, Bottom Oblique View

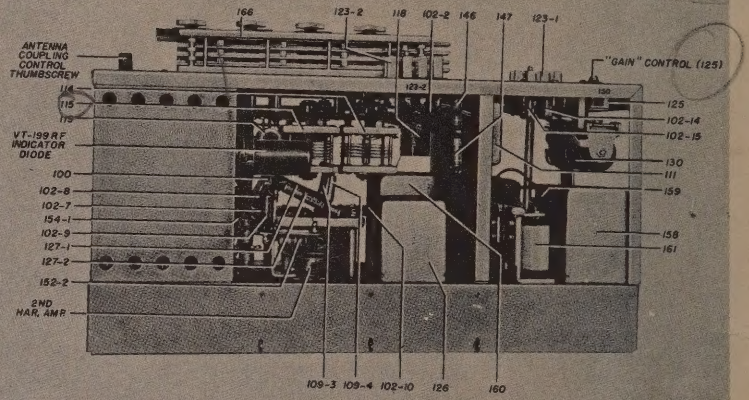
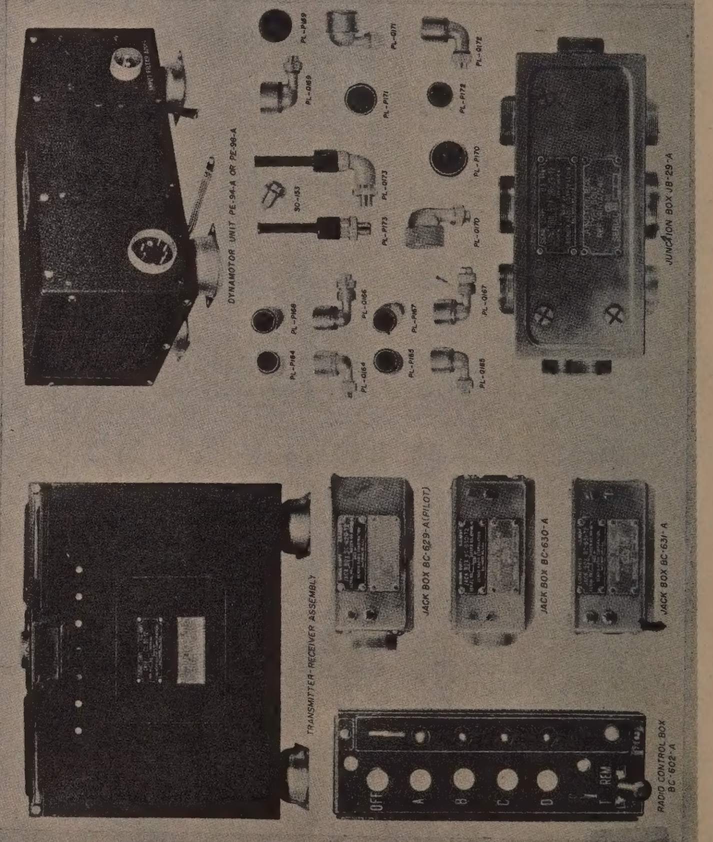


Figure 33 — Radio Transmitter BC-625-A, Rear View



Radio Set SCR-522-A or SCR-542-A, Components

T.V.I. ELIMINATION

Shields were made for all four open slides of the unit using bronze or copper screen wire. Pieces were cut to fit the slides, and all the edges of the screen were soldered to strips of galvanized sheet iron about 5/8" wide. These strips made frames for all the shield panels. A continuous strip of solder was run around all edges of the frames to insure solid grounding of each wire in the screen.

These panels were next drilled at 1" intervals all around the edges to pass small metal screws.

Corresponding holes were drilled into the frame of the transmitter, using care to see that no components received any damage.

Metal screws were used to fasten the shields onto the sides. These made a very R.F. tight shield for the sides. The copper screen is next to the chassis.

A bottom shield was made of sheet aluminum by bending ½" lips up on all four sides. This too should be fastened by drilling holes at 1" intervals, and using metal screws.

All openings in the front (or top) panel are covered as much as possible.

The opening for the four crystal sockets is mostly covered using a small piece of sheet metal, and soldering around the edges. A hole just large enough for one crystal is left over crystal socket 'D'.

A small piece of sheet metal is used to cover the original antenna jack opening, using metal screws and solder. A standard co-axial chassis fitting is installed in this cover directly over the original 'hot'antenna jack. A heavy piece of copper wire is soldered into the co-axial fitting prior to mounting it. This wire then passes down through the original jack, and is soldered to the jack connection.

All wires (except ground) are removed from between plug 123-2 and their first tie points. Each wire is replaced using shielded wire.

Ground the shielded wires at both ends using short heavy leads, or soldering directly. Also, ground at any convenient points in between.

By-pass the shielded wires at each end to ground, using .005 MF. Disc ceramic capacitors. Make the capacitor leads as short as possible.

Make or obtain a small metal cover for plug 123-2, to be installed over the inside terminals of the plug. This cover must be securely fastened and heavily grounded, preferably by soldering. Use any necessary insulation inside the cover.

Prior to installation of the cover, terminals 5,6,&7 should be grounded using copper strip.

The leads to the meter jack should receive the same kind of treatment, and a metal cover be installed over the jack and capacitors just as was the power plug 123-2.

The microphone jack should have a 1 M.H. R.F. choke installed in series with the ungrounded lead directly at the jack. By-pass the jack to ground on both sides of the choke using .0005 M.F. disc ceramic capacitors. Make the capacitor leads as short as possible. Place a metal cover over the jack and the choke and capacitors. Be sure the cover is heavily grounded. The lead wire is already shielded.

These procedures will almost completely eliminate T.V.I. even in 'fringe' areas. It may be necessary to use a high pass filter in the antenna lead having a cut off frequency of approximately 100 M.C. for perfect suppression.

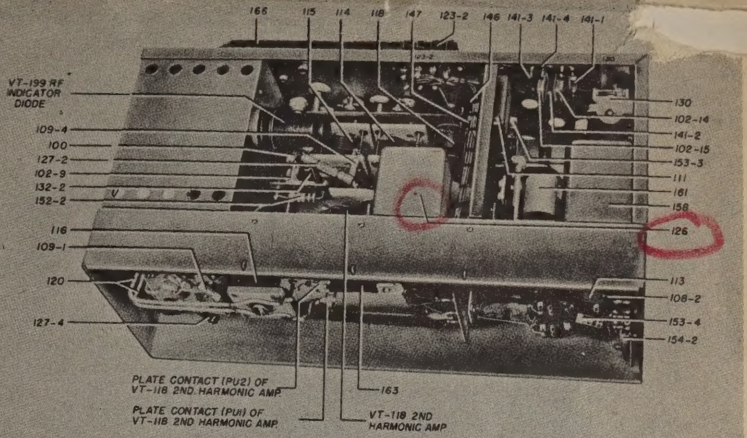


FIGURE 34 — RADIO TRANSMITTER BC-625-A, BOTTOM OBLIQUE VIEW

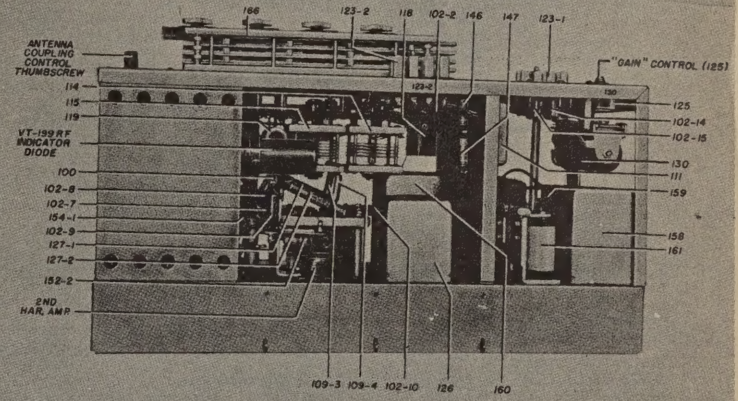


FIGURE 33 — RADIO TRANSMITTER BC-625-A, REAR VIEW

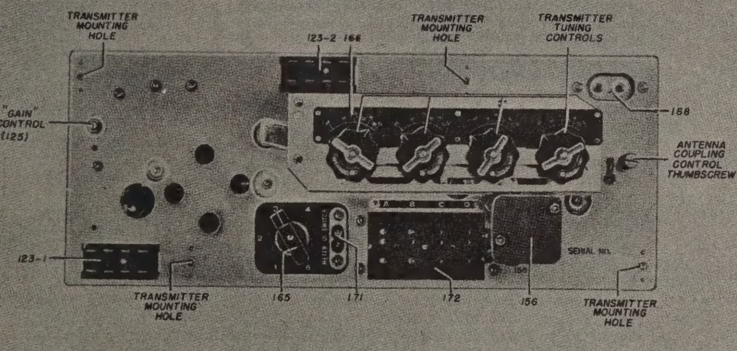

TRANSMITTER MOUNTING HOLE
123-2
166
TRANSMITTER MOUNTING HOLE
TRANSMITTER TUNING CONTROLS
168
"GAIN" CONTROL (125)
ANTENNA COUPLING CONTROL THUMBSCREW
SERIAL NO.
123-1
TRANSMITTER MOUNTING HOLE
165
171
172
156
TRANSMITTER MOUNTING HOLE

FIGURE 31 — RADIO TRANSMITTER BC-625-A, TOP VIEW

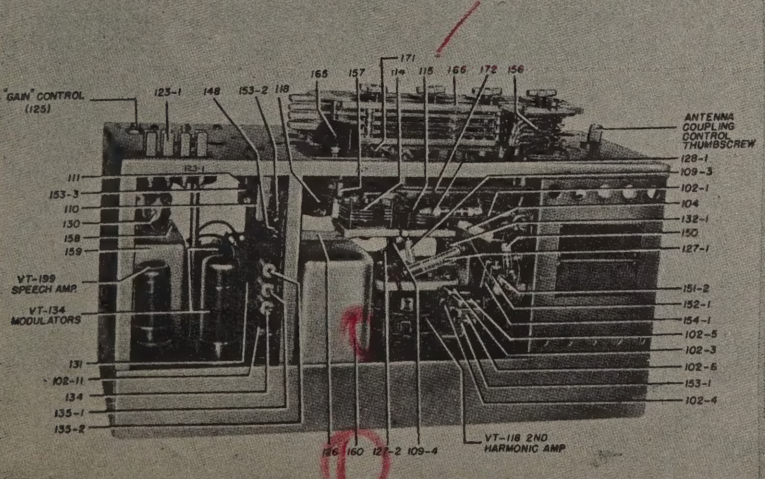
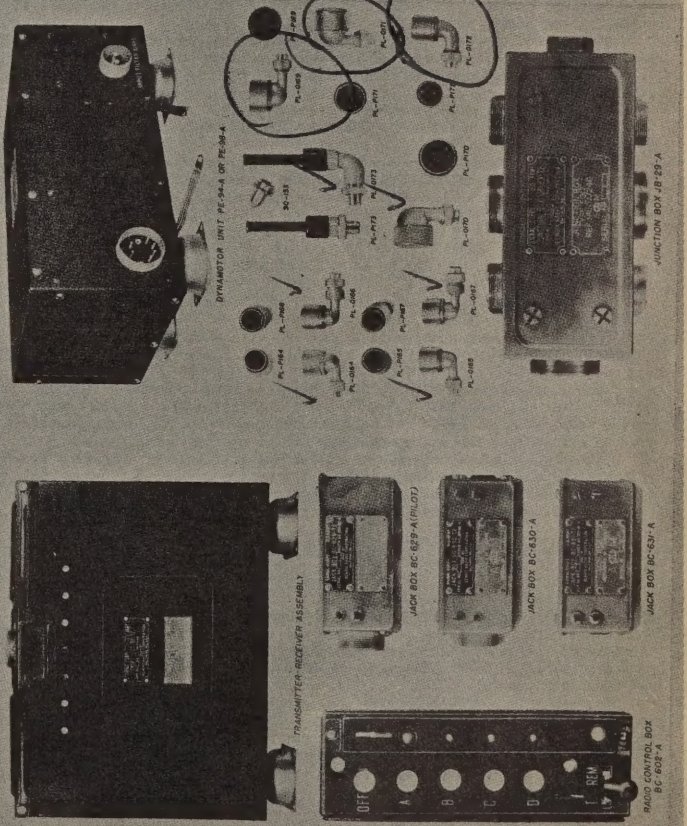
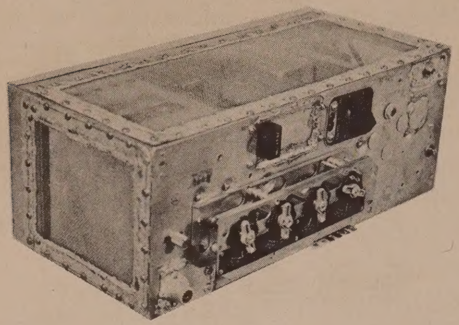


FIGURE 32 — RADIO TRANSMITTER BC-625-A, FRONT VIEW



RADIO SET SCR-522-A OR SCR-542-A, COMPONENTS

BC-625 ON 2 METERS



BC-625 TRANSMITTER with T.V.I. shielding in place

CONVERSION INSTRUCTIONS FOR RADIO TRANSMITTER BC-625-A
A PART OF RADIO SET SCR-522-A, TO OPERATE IN THE 144-
148 M.C. AMATEUR BAND.

Remove the transmitter from rack FT 244-A.

Remove all tubes. Be careful with both VT 118 tubes.

Unsolder all leads from plug 123-1. Unsolder all leads from relay 130. Remove relay 130.

Cut the lacing of the cables going to all three relays.

Unsolder the leads to relay 161 and remove it. Unsolder the leads to relay 131 and remove it.

Now most of the cabled wires to the relays are free and may be removed, including the two wires going through the chassis to the under side.

Remove the shielded wire from pin 3 of VT 134 to the 500k ohm resistor 140-2. Do not remove the shielded wire to transformer 160.

Disconnect the jumper between 138-3 and 140-3.

If desired, components 140-3, 140-2, 108-2, 140-4, 142, and 105-3 may be removed.

The small terminal board having four 1-Meg. resistors (141-1, 141-2, 141-3, 141-4), and two .006 Mfd. capacitors (102-14, 102-15) mounted on it may be removed. Remove the yellow lead going to pin 6 of plug 123-2. Remove the black lead with green tracer going to pin 5 of plug 123-2.

CHANGES IN THE MODULATOR

The gain of the 6SS7 speech amplifier stage was originally held down by using low screen voltage, and high bias.

Paralell the 1Meg. ohm resistor (138-3) with another 1 Meg. resistor 1 watt. Change the 2k ohm cathode bias resistor (153-3) to one of 470 ohm 2 watt.

Remove plug 123-1. Break off the mounting ears by bending back and forth. Cover the hole left by removal of plug 123-1 with a small metal plate, using machine screws and solder to fasten the plate. An appropriate jack to accommodate the microphone plug may be mounted on this plate.

The original microphone was an electromagnetic type or 'dynamic' (low impedance type. 200 ohm) microphone. A two button carbon microphone could be used, connecting the buttons to the yellow and green leads of the shielded wire lead coming up into the modulator compartment from transformer 158.

MODIFICATION TO USE A SINGLE CIRCUIT DYNAMIC TYPE MICROPHONE WILL BE DESCRIBED:

Disconnect terminal 2 of transformer 158 from ground. Ground terminal 1 of this transformer. Do not disconnect the yellow wire. Connect the free end of the green wire to the ungrounded terminal of the microphone jack. Connect the free end of the yellow wire and the shield lead to the grounded terminal of the jack. The green lead going to the center terminal of the gain control is a short one coming out of a hole in the metal tubing about 2½" down from the top.

Replace this lead with a wire long enough to go down through the tubing underneath the chassis to the 2k ohm resistor that goes to pin 4 of the 6SS7. Be sure the metal tubing is securely fastened to the chassis for mechanical reasons as well as for grounding.

Be sure that the normally grounded side of the gain control is grounded.

Ground terminal 4 of transformer 158, if it is not already grounded.

For convenience of metering, a standard opencircuit phone jack was mounted in one of the holes of the panel above the VT134-A modulator tubes. This must be done using insulating washers, as the B+ 300 volts is on the jack. Two wires are then run through the partition and connected to the terminals of the pins of the original metering plug.

The metering is done with a 1 M.A. Meter, and typical readings are as follows:

1-----.6-.8
2-----.5
3-----.5 unloaded .65 loaded
4-----open
5-----tune for max. (P.A. grid mils. full scale o.k.)
6-----open

MODIFICATIONS OF THE R.F. SECTION

Since the unit originally covered a range of 100-156 M.C., the tuning capacitors are much too large for convenient tuning over the smaller range.

Plates were stripped from the stators of all four tuning capacitors. This may be accomplished by using long nose pliers.

Grasp the plate close to where it is soldered to a tie bar, and then twist. This tears the plate free and then it may be pulled out.

The tuning condenser for the plate tank of the 6G6G was stripped until only one stator plate on each side was left.

The tuning condenser for the 12A6 plate tank was stripped until two stator plates on each side were left.

The tuning condensers for the plate tanks of both the 832'S were stripped until one stator plate on each side was left.

No coil changes were found necessary.

MODIFICATION OF THE FREQUENCY SHIFTER SLIDE MECHANISM

If no slide mechanism is received as part of the unit, couplings to extend the variable condenser shafts may be used. These should be of the reducing type to go from ¼" shaft to 5/32" shaft.

The slide mechanism may be removed as follows:

Obtain the correct size 'Bristo' wrench to loosen the set screws of the couplings between the mechanism and the variable condensers.

Use a hot soldering iron to soften the cement sealing the set screws. Loosen the set screws. Remove the machine screws holding the mechanism to the front panel. Remove the wing nuts and dial pointers.

The slide mechanism may now be removed. It will now be seen that the slide mechanism may be disassembled by removing four 6-32 nuts. This will leave the rear plate with only the four tuning shafts protruding. Remove all the 'dog's and washers from the shafts. Remove the slide shifters from the front portion.

Remove the four gang wafer switch. Re-assemble the frame of the slide shifter, and replace. The frame is necessary to provide support for the tuning shafts.

The dial pointers and wing nuts may now be replaced. Tighten the wing nuts to provide a small amount of friction for the tuning condenser shafts, and add a lock nut to each.

Since the four gang wafer switch is no longer needed, it may be removed. The original purpose of the switch was to switch crystals.

After removal of the switch, the white lead wire from pin #5 of VT 198-A must be connected to the ungrounded side of the crystal socket 'D'.

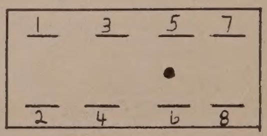
The others may have their ungrounded leads disconnected, and removed.

POWER SUPPLIES

To put the unit into operation, a power supply capable of 200 M.A. @ 300 volts, 12 volt heater supply @ 1.5 amps., and a bias supply capable of 150 volts @ 25 M.A. are necessary. The bias supply preferably should be regulated.

If the power transformer has a reserve of 20 M.A. or so, it may be used to obtain the negative bias voltage by connecting a second rectifier tube 'backwards'. The rectifier must be of the indirectly heated type such as a 6x5, or a separate filament winding must be provided. A transformer having a multi-tapped secondary is most convenient for use with this method of obtaining bias.

POWER PLUG CONNECTIONS



TERMINAL#	CONNECTION
1-----------	-150 V.
2-----------	12 V. hot
3-----------	+ 300 V.
4-----------	+ 300 V.
5-----------GND-	+ 150 V.
6----------- "	" " "
7----------- "	" " "
8----------- "	" " "

If, upon putting the unit into operation, the final grid mils seem too low, (less than 1 M.A.) the following things may be done to increase drive to the final:

The two 832'S have no external screen by-pass capacitors in the original unit. It was found that more final amplifier grid current was obtained when each 832 had its screen by-passed to its locating pin at the socket, as closely as possible. A 500 MMF ceramic disc capacitor should be used.

Additional grid current may be obtained by inserting a 2½ mh R.F. choke between the 50k ohm grid resistor and the grid terminal of the 12A6 tripler. Also remove the 50 ohm resistor from between the coupling capacitor to the 6G6G plate and the grid of the 12A6.

BC-624 ON 2 METERS

FEATURING SINGLE DIAL BANDSPREAD TUNING, AND
LOW NOISE CASCODE R.F. INPUT CIRCUIT.

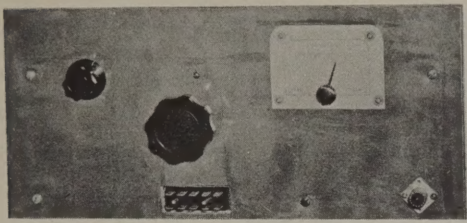


PHOTO- OF PANEL ARRANGEMENT OF CONVERTED SET.
THIS UNIT FITS VERY WELL INTO AN EMPTY TUNING
UNIT CASE OF THE B.C. 375 TRANSMITTER SET.

INSTRUCTIONS FOR MODIFICATION OF RADIO RECEIVER BC 624-A
A PART OF RADIO SET SCR 522-A FOR OPERATION IN THE 144 TO 148 M.C. AMATEUR BAND

Release the receiver from the rack ft 244A by removing the four mounting screws, and pulling upward on the rack.

Remove the tuning unit from the receiver by loosening the four splined (bristo) set screws in the flexible couplings which connect the slide tuning mechanism to the variable condenser shafts.

Complete the removal of the slide tuning mechanism by removing the appropriate machine screws.

Next, unsolder the seven wires from the terminal strips on the right and left sides of the tuning unit. Unsolder the ground strap and the plate lead to the 1st I.F. transformer.

Remove the machine screws holding the tuning unit in the main chassis.

Remove the screw holding the small baffle shield to the front panel.

Remove the small terminal strip holding resistor 259 on the front panel.

Now the entire tuning unit may be slipped out of the main chassis.

All components of the original crystal oscillator may be removed and discarded.

The two variable condenser gangs and their associated circuits may now be dismounted from their base plate.

The three gang tuning unit (216A,216B,216C) tunes the R.F. stage and the mixer grid circuit.

The two gang tuning unit (217A,217B) tunes the harmonic generator and harmonic amplifier.

Both units will be modified.

MODIFICATIONS OF THE THREE GANG UNIT

The original system employs a 9003 pentode R.F. amplifier, and a 9003 pentode mixer. Magnetic coupling is used for the injection of heterodyne frequency voltages.

The same tube complement may be employed after modification, or the R.F. stage may be changed to employ a more modern tube and circuit. Suggested is a 6BZ7 tube and a cascode circuit, also the mixer may be changed from pentode to triode.

If the same tube complement is used, the changes are not extensive or difficult.

The changes consist of re-winding the coils and stripping plates from the tuning condenser stators only. The shaft of the rotor is made of ceramic, and is too fragile to permit stripping of it's plates.

All coils are self supporting air wound.

The new coils will be shaped just as were the old ones. They are wound of # 12 enamelled copper wire, and are 3 turns each. They are wound on a 7/16" form. Their inductance may be adjusted by spreading the turns.

Back out all the trimmer capacitor screws as far as possible.

Using a sharp pair of diagonal wire cutting pliers, carefully cut the tie plate between the rear stator plate and the next one forward, of the section next to the shaft extension.

Bend the last stator plate out a little from the rest of the plates. Grasp the edge of the plate near the cut with the diagonals, and strip out, using the condenser frame for leverage.

These are split stator condensers, so a plate on each side must be cut loose and stripped to have the same effect as removing a plate of a conventional condenser.

Repeat this operation a plate at a time, until all but one stator plate on each side has been removed. Take care not to damage the last one.

When removing plates, always start at the end farthest from the point where the coil mounts.

The same procedure is repeated for the two remaining sections of the gang.

If no tube or circuit change is intended, this completes modification of the three gang unit when the coils are mounted.

CONVERSION OF THE R.F. STAGE TO A CASCODE CIRCUIT IS AS FOLLOWS:

Using a small (60 watt) soldering iron, carefully unsolder all condensers, resistors, etc. from the 9003 tube socket pins. Do not entirely remove the parts, as most will be re-used.

The socket for VT 203 and its mounting plate may now be removed by taking out the three machine screws and unsoldering the center post of the socket.

Remove the socket from the plate.

Carefully enlarge the hole (preferably by using a 3/4" punch) so that a 9 pin miniature socket can be mounted. Use one not equipped for a shield.

The socket should be placed on the plate so that when mounted, pins 1&9 are on the right hand side when facing the tuning condenser shaft with the tube up.

The socket is mounted on the bottom of its plate by soldering its ears to the plate.

Solder all grounds for the socket, the jumper between pins 3&6, and the 1 meg. resistor to pins 2&3. The socket and plate may now be re-mounted.

A little trimming of the vertical plate on which are mounted the socket and it's plate is necessary to accommodate the 9 pin socket. This may be done with the diagonal wire cutters.

After re-mounting the socket, the center pin of the socket may be re-soldered.

All the original mica capacitors and resistors are re-connected as shown in the cascode circuit diagram except the original screen dropping resistor. It is removed.

Two extra resistors are required. One 330 ohm ½ watt is placed in parallel with the original 330 ½watt cathode resistor. One 1 meg. ½w. is connected between pins 2&3.

The heaters for the 9003 mixer and the 6BZ7 are in series, and since the heater current for the 6BZ7 is .4 amp., the heater of the 9003 must be shunted to equalize the voltage drops. The shunt consists of a 25 ohm 5 watt resistor. These connections may be made on the terminal strip along side the unit. The 10 ohm resistor 259 and it's terminal strip have been removed, leaving extra tie points. These may be used to mount the 25 ohm resistor.

To further greatly reduce internally generated noise, convert the 9003 mixer from pentode to triode connection.

This may easily be done by removing the 330K ohm screen dropping resistor, and the mica screen by-pass capacitor connected to pin #6. After removal of the resistor and condenser, solder a jumper wire between pins #6 and #5. The plate voltage is now too high for this type of operation, so, remove the 4700 ohm filter resistor in the B+ lead to transformer 291. Replace with a 72K ohm 2 watt resistor. This reduces the mixer plate voltage to approximately 90 V.

These changes have caused a difference of effective capacity across the plate winding of transformer 291, so, it must have a small re-adjustment of the tuning slug. The I.F. frequency is 12 M.C.

MODIFICATION OF THE TWO GANG TUNING UNIT

The 9002 tube was originally used as a harmonic generator, following the crystal oscillator, which was ½ of the 12AH7 tube.

We shall use the 9002 as a tuned local oscillator. The 12AH7 tube is no longer used at all, as the squelch circuits are also discarded.

First remove both coils and modify the two gang tuning condenser exactly as was the three gang unit.

Back out both trimmer condenser screws completely.

Both new coils will be self supporting air wound, and of the same shape as the original coils.

Replace the rear coil with one of 3 turns wound on a 7/16" form of #12 enamelled wire. This stage continues to operate as a straight through amplifier.

Now we will convert the 9002 circuit to an ultra-audion oscillator as shown in the second diagram.

The first diagram shows the original circuit and points to disconnect.

Leads to condensers 202-13 and 202-14 are cut close to their connection points on tuning condenser 217B, and left in place. Their complete removal would be difficult, and is not necessary.

The 560K ohm grid leak is removed, and replaced with one of 10,000 ohms.

Capacitor 204 has one free lead now. Swing it to a position so that it may be connected as shown in the diagram. Be sure to connect to the correct side of the tuning condenser.

Supply a new B+ by-pass capacitor as shown in the diagram.

A new coil of #18 enamelled copper wire is wound. It is 4 turns wound on a 3/8" form. It is shaped exactly as was the original, and is soldered in exactly the same position, After the final adjustment of coils is complete, it may be advisable to cement a small piece of polystyrene across the coil turns. This will add to the stability of the oscillator.

Conversion of the front end is now complete except for final adjustments.

Replace the tuning condensers on their mounting plate. Replace the whole unit in the main chassis and re-solder all the connections that have not been eliminated.

The plate coil of the 6BZ7, the grid coil of the 9003 mixer, and the plate coil of the 9003 amplifier must be tightly coupled. The antenna link must also be tightly coupled to the 6BZ7 grid coil.

Final adjustments of the coils (and tuning condensers if necessary, these may have plates bent.) should be done using a griddipper, a known signal, or a signal generator.

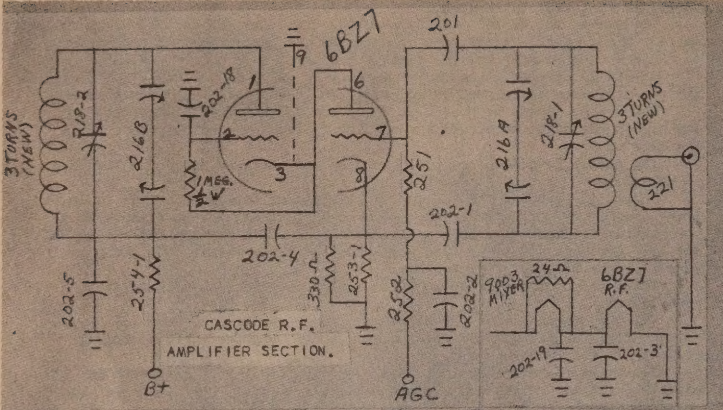
To obtain the best noise figure, a noise generator should be used. See QST of July 1953, page 10, for information concerning the technique.

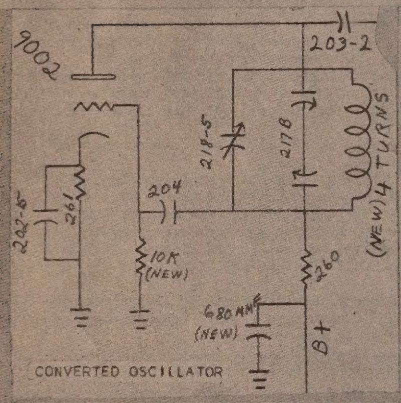
Other modifications are possible, but that will be left to the ingenuity of the individual.

Some changes in the audio section are very helpful.

Since VT207 (12AH7) is no longer used for either of its original purposes, it's socket could be utilized for a 12A6 power audio stage.

The unit may have either 2 dial or single dial tuning control. Single dial tuning was accomplished as shown in the photographs.





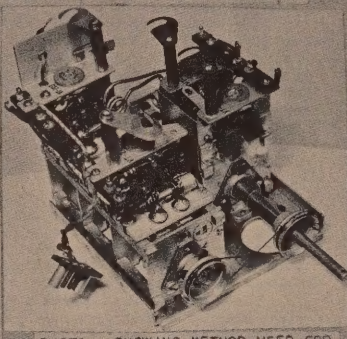
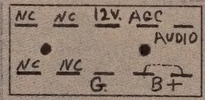


PHOTO – SHOWING METHOD USED FOR SINGLE DIAL CONTROL.



POWER PLUG CONNECTIONS

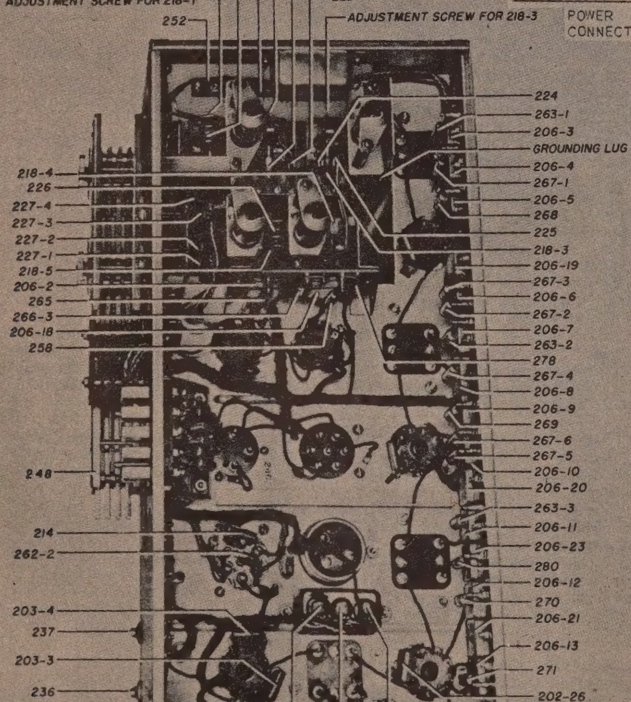


Figure 39 — Radio Receiver BC-624-A, Front View

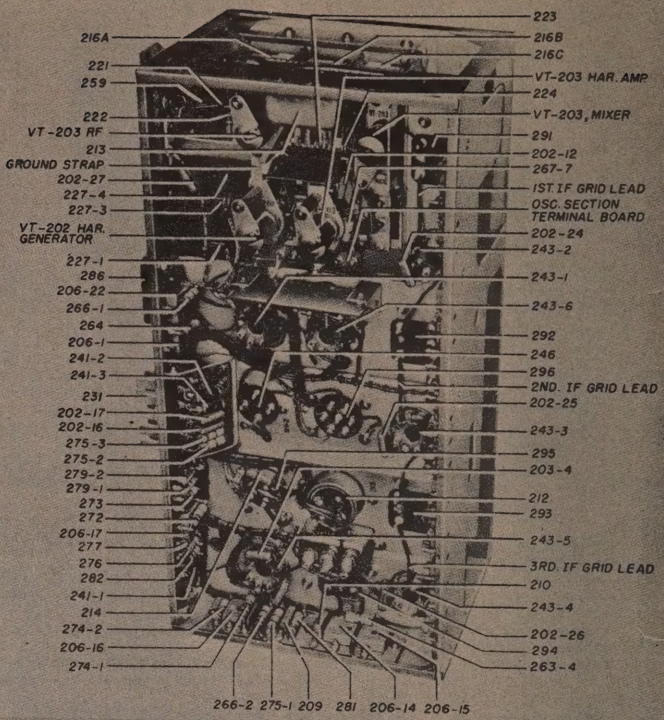


Figure 40 — Radio Receiver BC-624-A, Front Oblique View

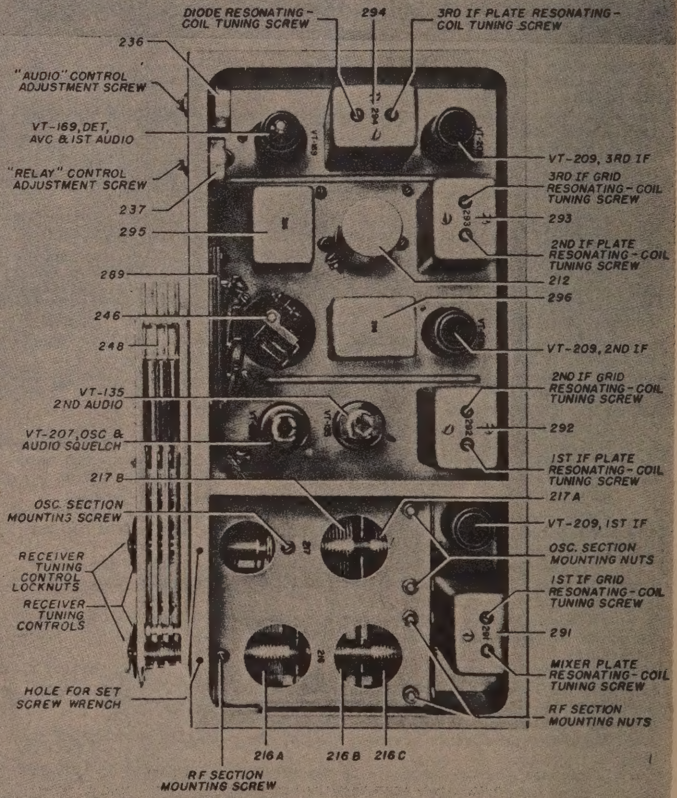

DIODE RESONATING-COIL TUNING SCREW
294
3RD IF PLATE RESONATING-COIL TUNING SCREW
236
"AUDIO" CONTROL ADJUSTMENT SCREW
VT-169, DET, AVC & 1ST AUDIO
"RELAY" CONTROL ADJUSTMENT SCREW
237
295
289
246
248
VT-135 2ND AUDIO
VT-207, OSC & AUDIO SQUELCH
217 B
OSC. SECTION MOUNTING SCREW
RECEIVER TUNING CONTROL LOCKNUTS
RECEIVER TUNING CONTROLS
HOLE FOR SET SCREW WRENCH
216A
216B
216C
RF SECTION MOUNTING SCREW
VT-209, 3RD IF
3RD IF GRID RESONATING-COIL TUNING SCREW
293
2ND IF PLATE RESONATING-COIL TUNING SCREW
212
296
VT-209, 2ND IF
2ND IF GRID RESONATING-COIL TUNING SCREW
292
1ST IF PLATE RESONATING-COIL TUNING SCREW
217A
VT-209, 1ST IF
OSC. SECTION MOUNTING NUTS
1ST IF GRID RESONATING-COIL TUNING SCREW
291
MIXER PLATE RESONATING-COIL TUNING SCREW
RF SECTION MOUNTING NUTS

Figure 37 – Radio Receiver BC-624-A, Rear View

(b) Set OPERATING CHANNEL switch to number corresponding to frequency selected.

(c) Release RECEIVER TUNING dial lock.

(d) If signal to be received is in frequency range 1680 to 2750 kc,

1. Set RECEIVER BAND SWITCH to CRYSTAL 1.

2. Set RECEIVER TUNING dial to desired frequency, reading at indicator marked BAND 1.

(e) If signal to be received is in frequency range 2750 to 4250 kc,

1. Set RECEIVER BAND SWITCH to CRYSTAL 2.

2. Set RECEIVER TUNING dial to desired frequency, reading at indicator marked BAND 2.

(f) Advance A.F. GAIN control (clockwise) until signal is heard in loudspeaker.

(g) If the background noise is too great when signal is heard, set RECEIVER BAND SWITCH to MANUAL position and repeat paragraph 22a. (2) (g).

NOTE: With crystal control, RECEIVER TUNING dial setting will be much less critical than in the case of manual control; however, it should be adjusted for the loudest signal and least background noise or interference.

(h) Lock the RECEIVER TUNING dial.

(i) To change frequency, set OPERATING CHANNEL Switch to a different channel and repeat steps (c) thru (h).

(4) Miscellaneous Controls

(a) Handset or Headset Reception:- The above describes reception on the loudspeaker. It will be found that the signal will also be present in the handset earpiece or headset (whichever is connected to Remote Control Unit RM-21-B). The signal in the handset or headset is subject to separate control of volume by the gain control located under the arrow below the CHOKE button on the remote control unit.

(b) The loudspeaker may be turned off by setting the ON-OFF SPEAKER switch to OFF. It is normally used for convenience in tuning the receiver. The loudspeaker should be turned off when the operator is transmitting from a position directly in front of the transmitter, to avoid audio feedback.

(c) The ON-OFF STATIC FILTER switch when turned ON reduces the effect of electrical interference and static. Its use is recommended when reception is noisy or difficult. When this switch is OFF the static filter has no effect on the received signal.

(5) To Stop Receiver

(a) Set the ON-OFF (main power) switch, located on the front of Power Supply Unit PE-110-B, to OFF.

b. To Receive (a-c operation from Power Unit PE-108-B)

(1) Place receiver in operation as in par. 22.a(1), (Battery Operation).

(2) To start Power Unit PE-108-B

(a) Press the START button on Remote Control Unit RM-21-B and hold closed until Power Unit PE-108-B starts. The power unit should come up to even speed and run smoothly, and both TRANSMITTER and RECEIVER pilot lamps on the transmitter should light, indicating that both are ready for operation.

(b) Release START button.

NOTE: If the power unit is cold, it may be necessary to press CHOKE button on the remote control unit while pressing START button, until engine starts.

(3) To Tune Receiver
Follow same procedure as in paragraph 22 a, (2) or (3). Operation will be identical.

(4) To Stop Power Unit

(a) Press STOP button on Remote Control Unit RM-21-B until Power Unit PE-108-B has come to a complete stop. If ON-OFF switch on Power Supply Unit PE-110-B has been left ON, the receiver will continue to operate. (The battery is automatically switched on and off as Power Unit PE-108-B is stopped or started).

c. To Transmit

(1) Start Power Unit PE-108-B as described in par. 22.b. and put receiver in operation.

(2) Make sure that OPERATING CHANNEL switch is set for desired crystal frequency.

(3) Press the press-to-talk switch on Handset TS-11-J (or Microphone T-24-( ) if used). An indication on the DC CURRENT meter will be noticed, as well as some indication on the ANTENNA CURRENT meter.

(4) Rotate ANTENNA TUNING dial until ANTENNA CURRENT meter reads maximum. The DC CURRENT meter should now read between 150 and 210 ma.

(5) Modulate the transmitter by speaking distinctly and in a normal tone of voice into the microphone or mouthpiece of the handset.

Don't MUMBLE QUIETLY INTO YOUR MIKE —
Sound Off!
W.H.
IBC-12

(6) When finished speaking, release the press-to-talk switch on handset or microphone; this puts the transmitter off the air and switches the receiver on again.

d. To Change Transmitter Frequency. This is accomplished by setting the OPERATING CHANNEL switch to a different position and repeating the steps outlined in par. 22.c. (3) and (4). Caution: Do not change the position of the OPERATING CHANNEL switch while pressing the press-to-talk switch on either the handset or microphone.

e. Receiving and Transmitting Channels. Changing the position of the OPERATING CHANNEL switch changes the frequency of both transmitter and receiver. Unless specifically directed not to do so, the operator should tune both the receiver and the transmitter immediately after switching to a new operating channel.

f. Operation from a-c source of power other than Power Unit PE-108-B. (1) The components of Radio Set SCR-543-B may be operated without Power Unit PE-108-B providing a source of 115 volts, 60 cycle, single phase a-c power is available (within 25 feet), which can supply 600 watts. For this operation the components are connected in normal manner except as follows:

(a) Caution: Make no connection to PL$_5$ on Power Supply Unit PE-110-B.

(b) Use Cord CD-511-B (from Chest CH-73-B) for providing the connection. Proceed as follows:

1. Plug one end of Cord CD-511-B into receptacle SO$_4$ (marked 115 V. A. C.) on the power unit.

2. Plug the other end of this cord into a receptacle providing the a-c power.

(2) Operation of receiver and transmitter is similar to that already described for a-c operation; with the following exception:

(a) The ON-OFF switch on the power unit controls the power. Turning it OFF stops both receiver and transmitter.

(b) No battery operation of receiver for stand-by monitoring is provided.

(c) References to stopping and starting the power unit should be disregarded as this unit is not connected, in this case.

g. Power Unit PE-108-B. When this unit is disconnected from the other components of Radio Set SCR-543-B it may be operated for test or other purposes. Once in operation it may be stopped by pressing the stop switch located on the magneto housing directly below the exhaust pipe outlet.

SECTION III - MAINTENANCE

23. POWER UNIT PE-108-B MAINTENANCE PROCEDURE.-

a. Change oil after every fifty hours of operation. Approximately 1-3/4 pints are required. To change oil, proceed as follows:

(1) Place tray under oil drain located beneath gasoline storage tank.

(2) Remove oil filler plug and oil drain plug by unscrewing them.

(3) Allow oil to drain out completely.

(4) Replace lower plug.

(5) Select funnel from box labelled "Tools and Spare Parts for Power Unit PE-108-B".

(6) Using this funnel, pour oil in thru the oil filler hole until it overflows, using the proper grade of oil as indicated below.

(a) S.A.E. #30 for warm weather.

(b) S.A.E. #20 or #10W for cold weather.

(7) Replace oil filler plug.

(8) Make certain both the oil filler and oil drain plugs are tightly screwed in place.

b. Check storage battery on Power Unit PE-108-B as follows:

(1) Remove each vent-cap and observe level of electrolyte.

(2) If level is up to bottom of filler well, the quantity of electrolyte is sufficient.

(3) If level is below filler well, add distilled water till level is seen visibly rising in filler well.

(4) Replace each vent-cap and screw it on tightly by hand.

(5) Tighten the connections of storage battery cables at each storage battery terminal and at each control box terminal.

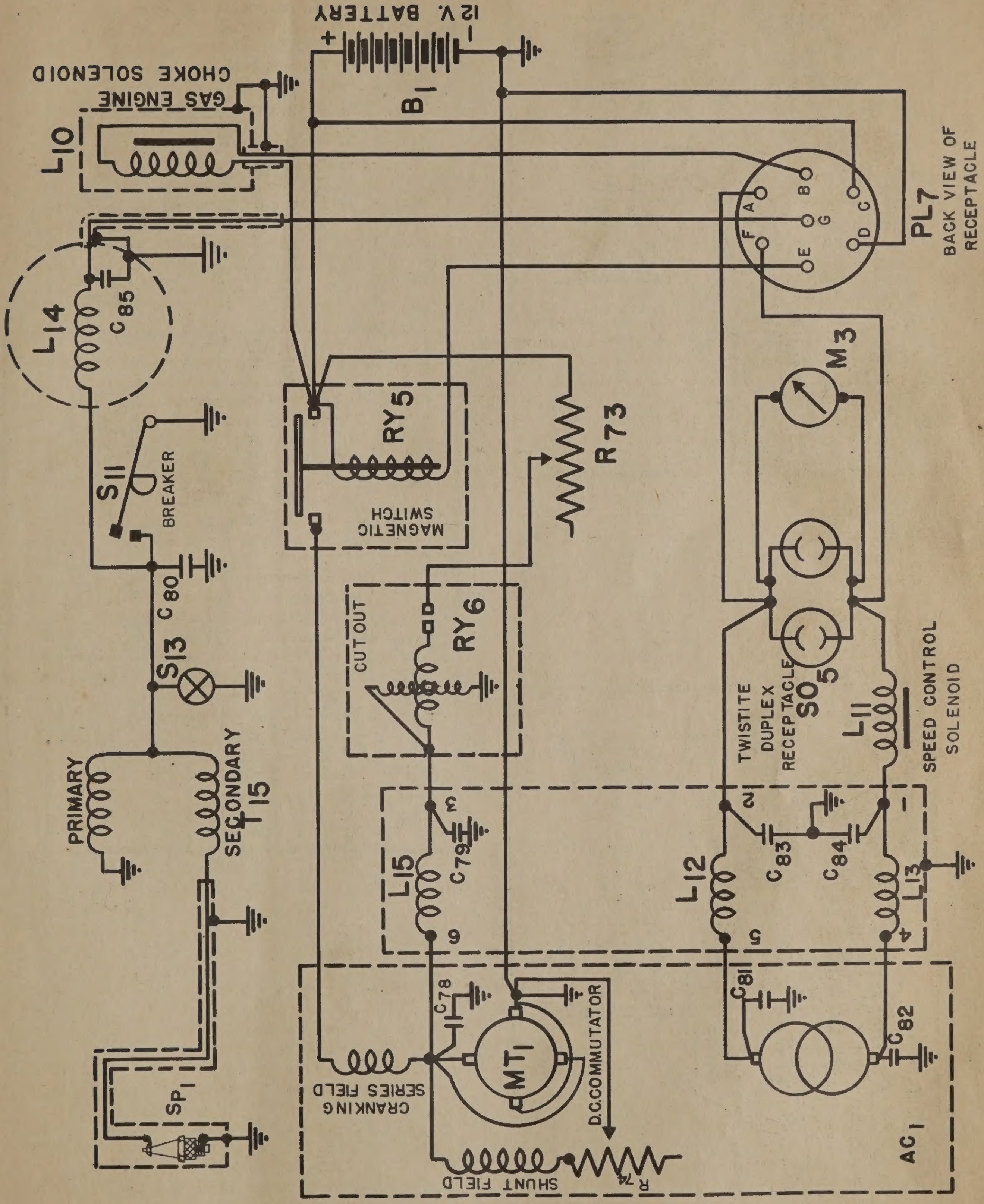
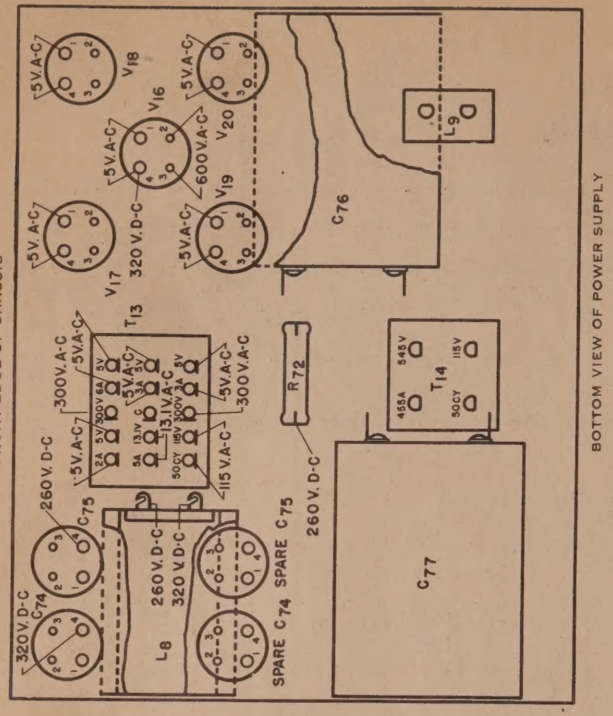
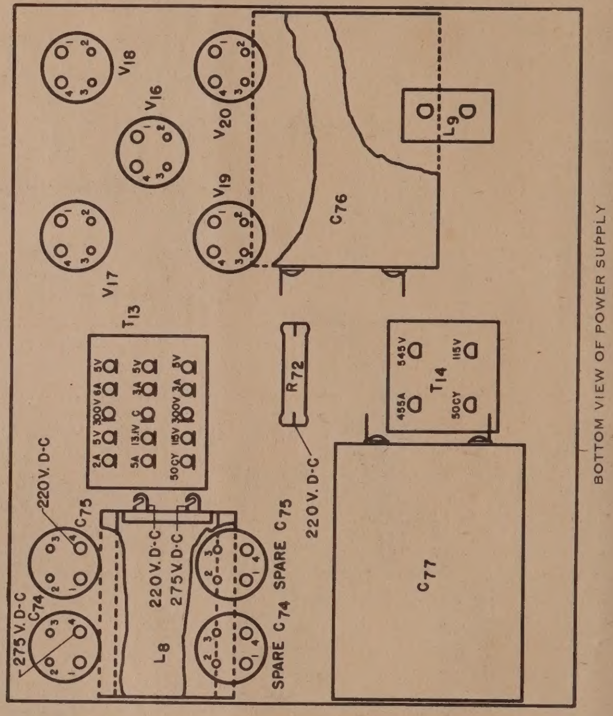


Fig. 15. Power unit PE-108-B, schematic diagram.

SOCKET VOLTAGES OF POWER SUPPLY UNIT
PE-110-B RECEIVE POSITION
FRONT EDGE OF CHASSIS



SOCKET VOLTAGES OF POWER SUPPLY UNIT
PE-110-B VIBRAPACK OPERATION OF RECEIVER
FRONT EDGE OF CHASSIS



NOTE: ALL VOLTAGES MEASURED WITH 20,000 OHM PER VOLT WESTON MODEL 772 ANALYZER.

VOLTAGES MEASURED TO GROUND UNLESS OTHERWISE INDICATED.

SOCKET VOLTAGES OF POWER SUPPLY UNIT
PE-110-B TRANSMIT POSITION
FRONT EDGE OF CHASSIS

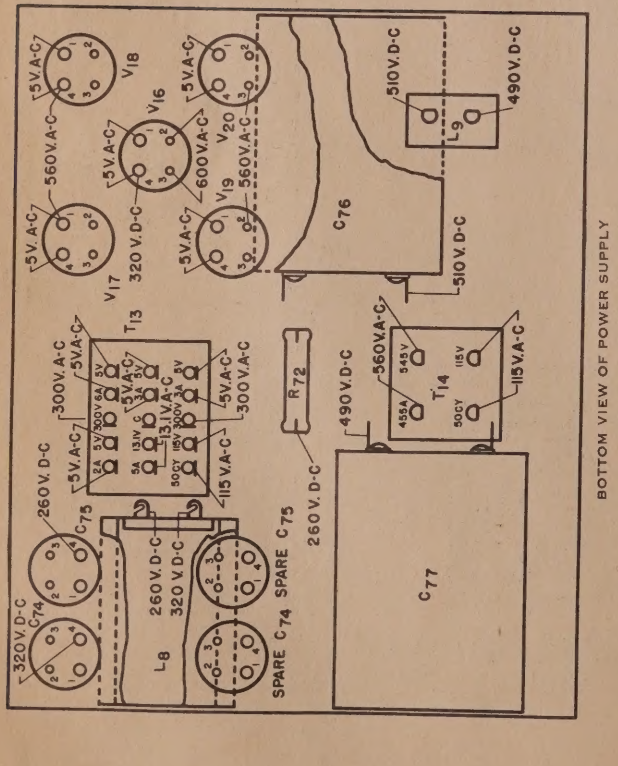
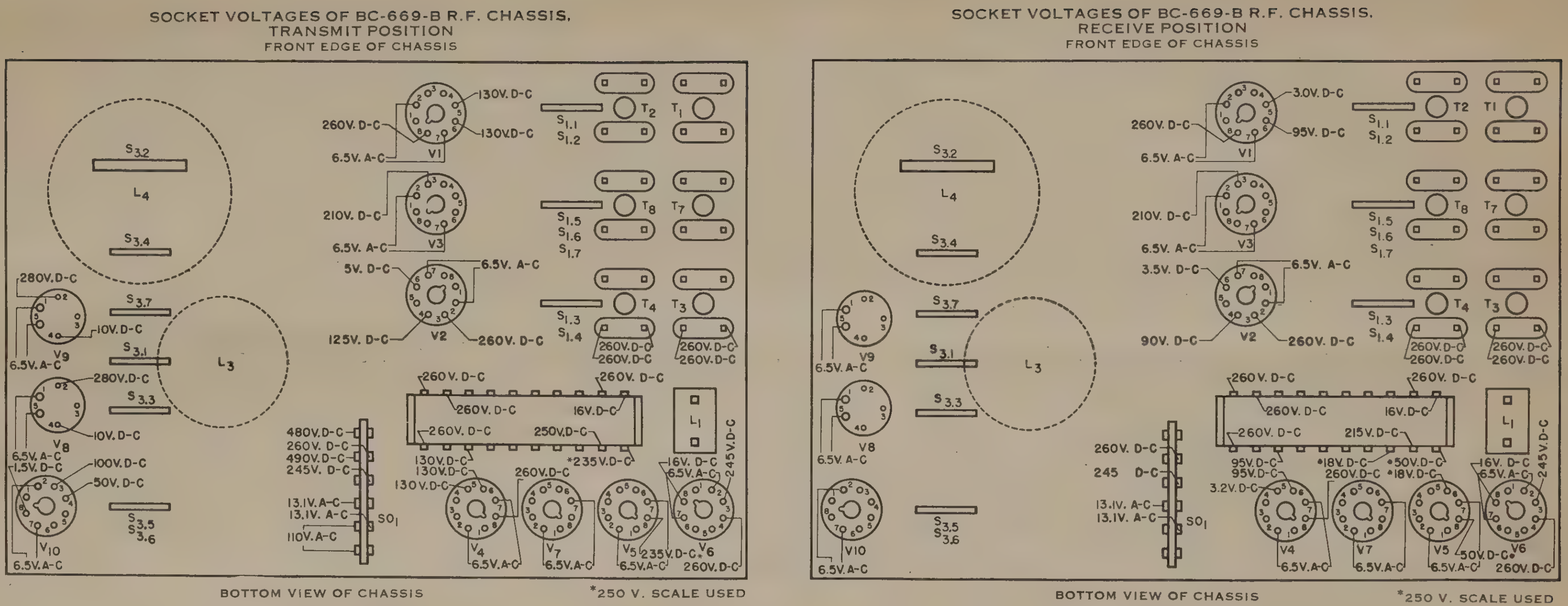


FIG. 16. POWER SUPPLY UNIT PE-110-B TUBE SOCKET LAYOUT DIAGRAMS SHOWING VOLTAGES.



SOCKET VOLTAGES OF BC-669-B R.F. CHASSIS.
TRANSMIT POSITION
FRONT EDGE OF CHASSIS

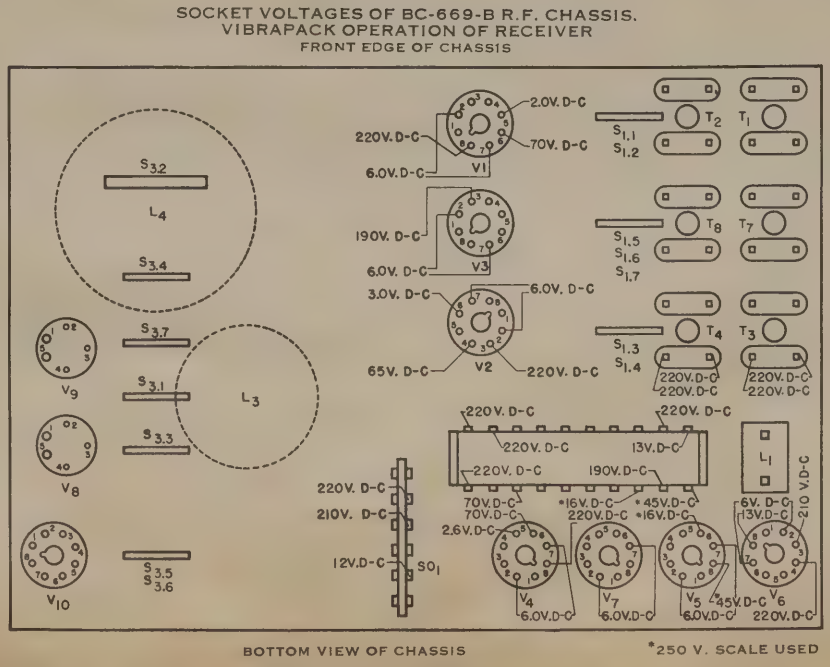
BOTTOM VIEW OF CHASSIS

*250 V. SCALE USED

SOCKET VOLTAGES OF BC-669-B R.F. CHASSIS.
RECEIVE POSITION
FRONT EDGE OF CHASSIS

BOTTOM VIEW OF CHASSIS

*250 V. SCALE USED



SOCKET VOLTAGES OF BC-669-B R.F. CHASSIS.
VIBRAPACK OPERATION OF RECEIVER
FRONT EDGE OF CHASSIS

BOTTOM VIEW OF CHASSIS

*250 V. SCALE USED

NOTE: ALL VOLTAGES MEASURED WITH 20,000 OHM PER VOLT WESTON MODEL 772 ANALYZER.

VOLTAGES MEASURED TO GROUND UNLESS OTHERWISE INDICATED.

FIG. 17. TRANSMITTER R.F. SECTION AND RECEIVER TUBE SOCKET LAYOUT DIAGRAMS SHOWING VOLTAGES.

c. Refill the gasoline storage tank as follows:
 (1) Remove the cap.
 (2) Fill to within one inch of the top but not higher with a regular grade of clean gasoline. (At least 67 octane rating).
 (3) Replace the cap, screwing it tightly in place.

d. (1) Remove and examine the spark-plug at least once each month.
 (2) Replace any spark-plug having badly burned or worn points or having a crack in the ceramic portion of the plug.

Note: Spare spark-plugs are contained in the black metal box labelled "Tools and Spare Parts for Power Unit PE-108-B". This box is located in Chest CH-73-B.

e. Keep Power Unit PE-108-B cleaned by wiping accumulated oil and foreign matter off the surface of the engine and the base.

f. Examine the generator brushes every 500 running hours. The d-c or commutator brushes can be examined by removing the brush holder staple and pulling out the brush assembly. The a-c brushes are fitted into die-cast brush holders with separate springs, and it is necessary to remove the brush holder strip which is fastened to the top of the brush holder with two small screws. If it is found that the brushes have worn down to a length of 3/8 inch, they should be replaced. If the brushes appear not to have been worn, be careful to replace them in the same position from which they were removed so as not to disturb the electrical contact between the armature and the brushes.

g. Inside the control compartment of the power unit is a variable resistor for setting the battery charging rate. The normal setting is at the LOW end, and this will result in a nominal charging rate of 2.5 amps. If the battery is low and should be charged quickly, the resistor slider may be moved to the HIGH end.

24. MAINTENANCE OF RADIO COMPONENTS. -

a. Routine Maintenance

The radio set components should be periodically cleaned and checked for tightness of connections, etc. Any dust that accumulates on the interior should be blown out. Tubes and crystals should be firmly seated in their sockets.

b. Normal meter readings.

D. C. CURRENT

Meter switch set at MOD. PLATE - 200 - 230 ma.

Meter switch set at P.A. PLATE - 150 - 210 ma.

Meter switch set at P.A. GRID - 4 - 6.5 ma.

ANTENNA CURRENT

1800 k.c.	1.2 - 1.5 amps.
4000 k.c.	1.2 - 1.5 amps.

c. Replacement of tubes, fuses, and lamps
 (1) Radio Receiver and Transmitter BC-669-B
  (a) To replace pilot lamps.
   1. Unscrew the glass jewel from the front of the panel.
   2. Using the fingers, press in, turn and remove the pilot lamp.
(Its socket is of the bayonet-catch type.)
   3. Insert new pilot lamp and replace glass jewel.
  (b) To replace tubes in the r-f section.
   1. Open the top lid to Chest CH-133-A.
   2. Raise the lid of the metal cabinet, giving access to all tubes and crystals in the r-f compartment.
  (c) To replace tubes in the modulator section, the transmitter must be removed from Chest CH-133-A as follows:
   1. Lay the chest on its back.
   2. Unsnap the six fasteners holding the transmitter to its back. (Refer to par. 8.e.)
   3. Lift up and out by the two front panel handles. Access to the modulator compartment may be had through the rear.
  (d) If it is desired to separate the r-f section from the modulator section proceed as follows:
   1. Unsnap the four fasteners holding the two sections together.
   2. Reach inside and detach plug PL1.
   3. Lift off the r-f section.
 (2) Power Unit PE-110-B
  (a) To replace fuses.
   1. Unscrew the black knurled bakelite knobs on the front of the power units.
   2. Remove old fuse.
   3. Insert new fuse into the holder mounted on the chassis front.
   4. Screw the knob back into place.
  (b) To replace tubes, it is necessary to remove Power Unit PE-110-B from Chest CH-132-A and remove the top metal cover. The unit slides out of the chest after lifting the latches on either side. It remains attached to a wooden base by the shock-mounts, and the metal cover may be lifted off after removing the screws around its sides. A screw-driver for doing this may be found in the tool box located in Chest CH-73-B.

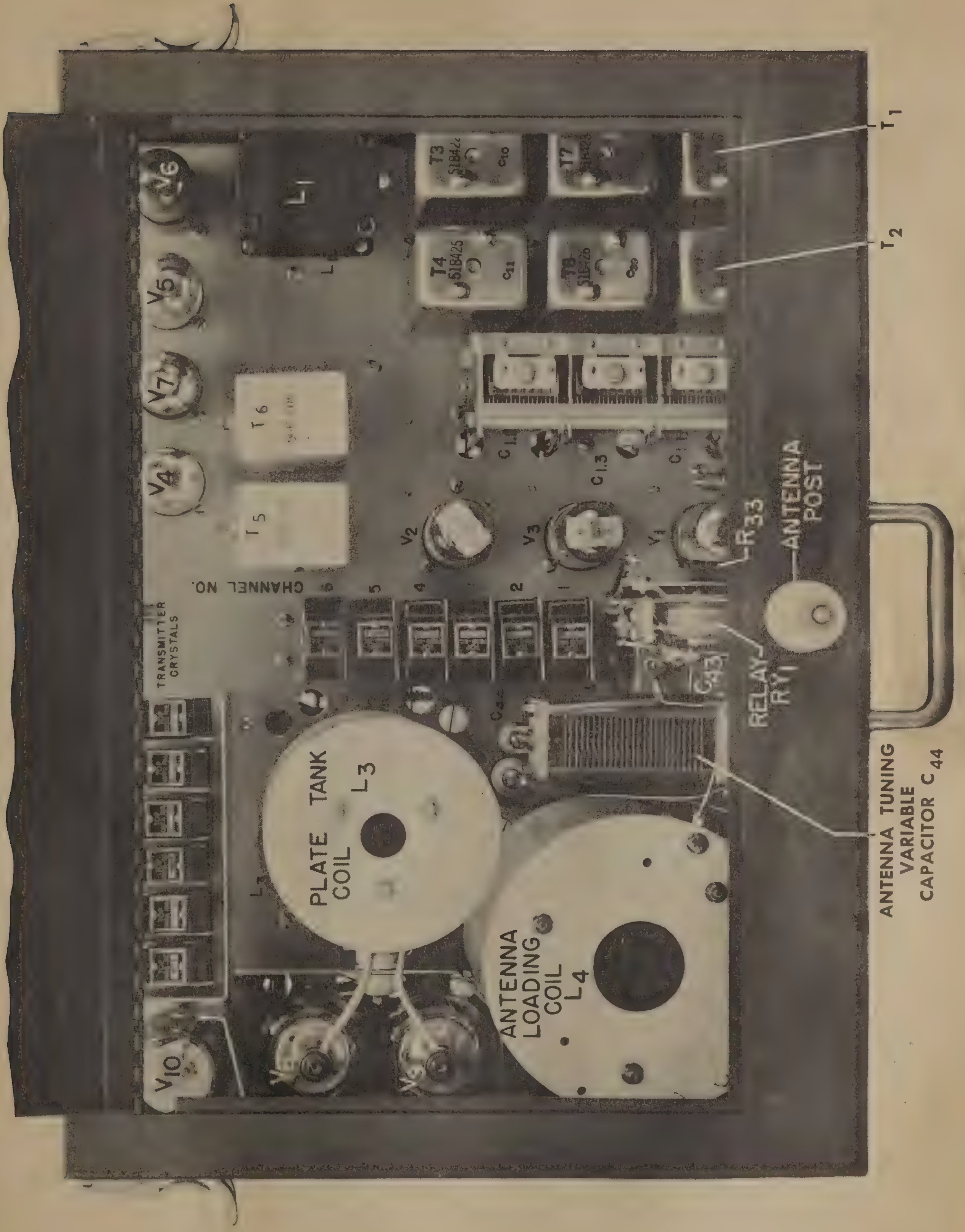


FIG. 18. RADIO RECEIVER AND TRANSMITTER BC-669-B, TOP VIEW OF R.F. CHASSIS.

25. PRETUNING CHANNELS. - All pretuning adjustments for operation on frequencies outlined in par. 8.g. have been made at the manufacturer's plant before shipment. However, if new channels are to be used, or if adjustments have been altered during servicing, follow instructions outlined below:

- a. Receiver. - No adjustments need be made on the receiver to pretune it other than to plug the desired crystals (in Crystal Holders FT-171-B) into the proper crystal sockets. Figure 18 shows the location of the receiver crystal sockets. The sockets are numbered to correspond to the position of the OPERATING CHANNEL switch. The receiver crystal frequency must differ from the desired receiving frequency by 385 kc. For example, if it is desired to receive on a frequency of 2280 kc. in Channel 3, a crystal having a frequency of 2665 kc. (or 1895 kc.) is plugged into receiver crystal socket #3.
- b. To Pretune Receiver, proceed as follows:
  - (1) Unlatch and lift open cover door in top of Chest CH-133-A.
  - (2) Unlatch and lift open top cover door in the metal cabinet within the chest.
  - (3) Plug crystal of proper frequency into the receiver crystal socket whose number corresponds with the number of the channel selected for operation.
- c. Transmitter. - Figure 18 shows the location of the transmitter crystal sockets and tuning components. Crystals (in Crystal Holders FT-171-B) having the same frequencies as the desired transmitter operating frequencies should be used. The crystal sockets are numbered to correspond to the positions of the OPERATING CHANNEL Switch. Design of the equipment does not require that the crystals be arranged in any particular order, although they are usually arranged in order of frequency for convenience in referring to the tuning chart on the front panel. The following adjustments have already been made on this transmitter at the time of manufacture and may be disregarded before operating initially unless it is desired to change any of the operating frequencies.
- d. To pretune transmitter, proceed as follows: (See Figure 18).
  - (1) With Radio Set SCR-543-B connected for operation and supplied with a-c power, turn the ON-OFF switch of Power Supply Unit PE-110-B to ON. (Refer to Safety Notice, page 3).
  - (2) On the transmitter, plug crystal of desired frequency into the transmitter crystal socket whose number corresponds with the channel number selected for operation.
  - (3) Turn the OPERATING CHANNEL switch to selected channel number.
  - (4) Remove the cover plate under the inscription P.A. PLATE TUNING. This permits access to the plate tuning condenser shafts.
  - (5) Move the sliding contactor (whose number corresponds to the channel number) on the "A" side of the plate tuning coil down to the bottom of the coil.
  - (6) Move the sliding contactor on the "P" side under numbered position corresponding to the channel number, to approximately the center of the coil.
  - (7) Remove the cover plate over the inscription METER SWITCH and set the switch to position marked P. A. PLATE.
  - (8) Turn the transmitter on by pressing the press-to-talk switch on handset or microphone, (DC CURRENT meter will now indicate some value).
  - (9) Use the 1/2 inch socket wrench provided in the tool box to unlock the shaft of the plate tuning capacitors by loosening the locking nut. Using a screwdriver, turn the slotted shaft of the plate tuning capacitor, whose number corresponds to the channel number, until the plate current is a minimum. Note: When the slot is horizontal the capacity is at mid-value. Do not turn it past the vertical position.
  - (10) Turn the transmitter off and move the same "P" sliding contactor on the plate tuning coil a few turns toward the top.
  - (11) Repeat (8), (9) and (10) and continue these readjustments until the plate current dips to a minimum and rises again while the plate tuning condenser is being turned in one direction, but thru not more than 180°, during which the slot must not turn past vertical.
  - (12) Then set the shaft to the position producing a minimum plate current. (This will be about 40 to 60 ma.) If no minimum is obtained repeat the above procedure, moving the sliding contactor downward, however, instead of upward.
  - (13) Repeat the above procedure with any remaining channels, whose frequency it is desired to change.
  - (14) Adjust the antenna circuit in the following manner:
    - (a) Set the OPERATING CHANNEL switch to the channel number selected for tuning.
    - (b) Move the correspondingly numbered sliding contactor on the "A" side of the plate tuning coil up approximately five turns.

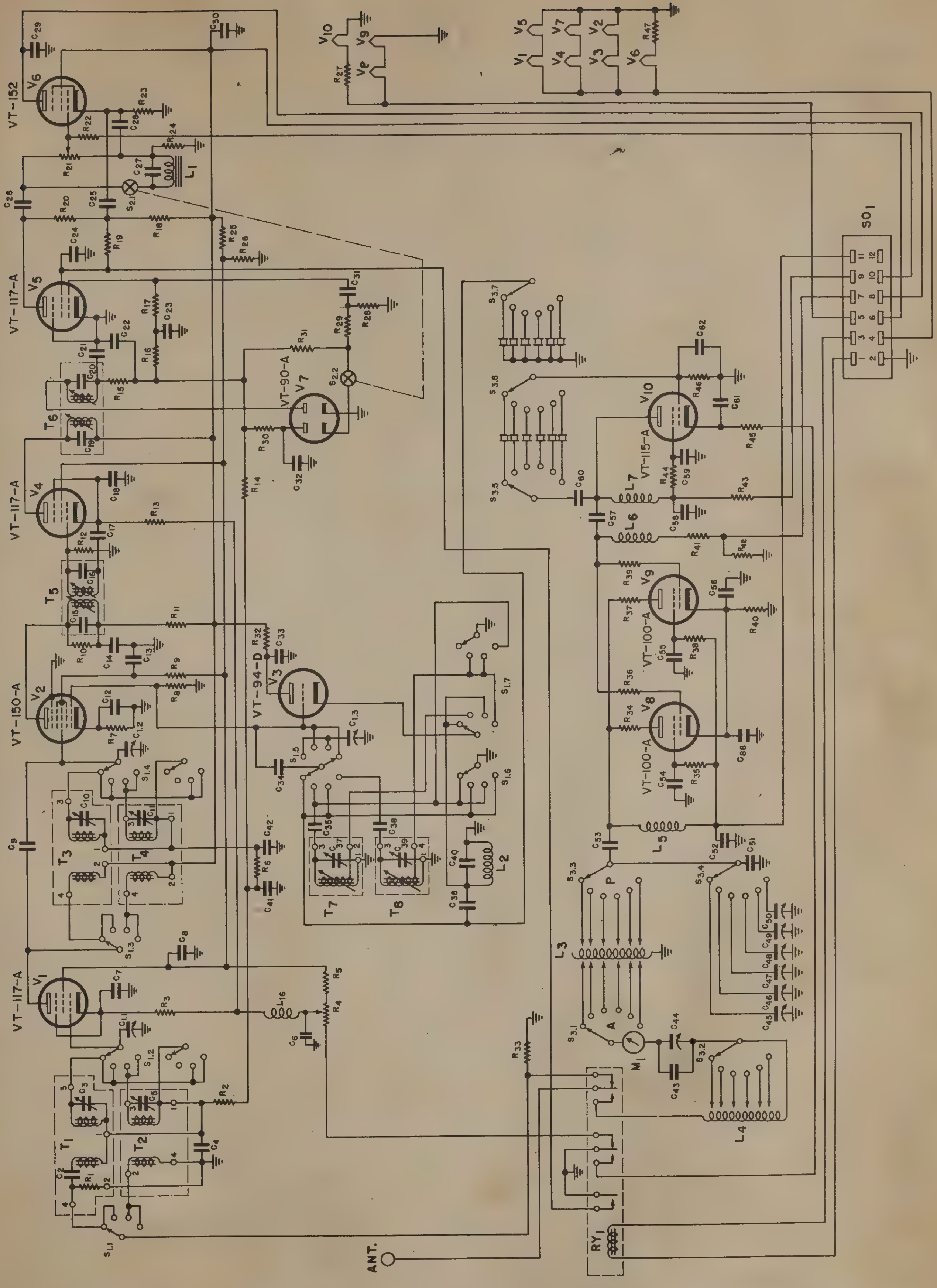


FIG. 19. RADIO RECEIVER AND TRANSMITTER BC-669-B, SCHEMATIC DIAGRAM OF TRANSMITTER R.F. SECTION AND RECEIVER.

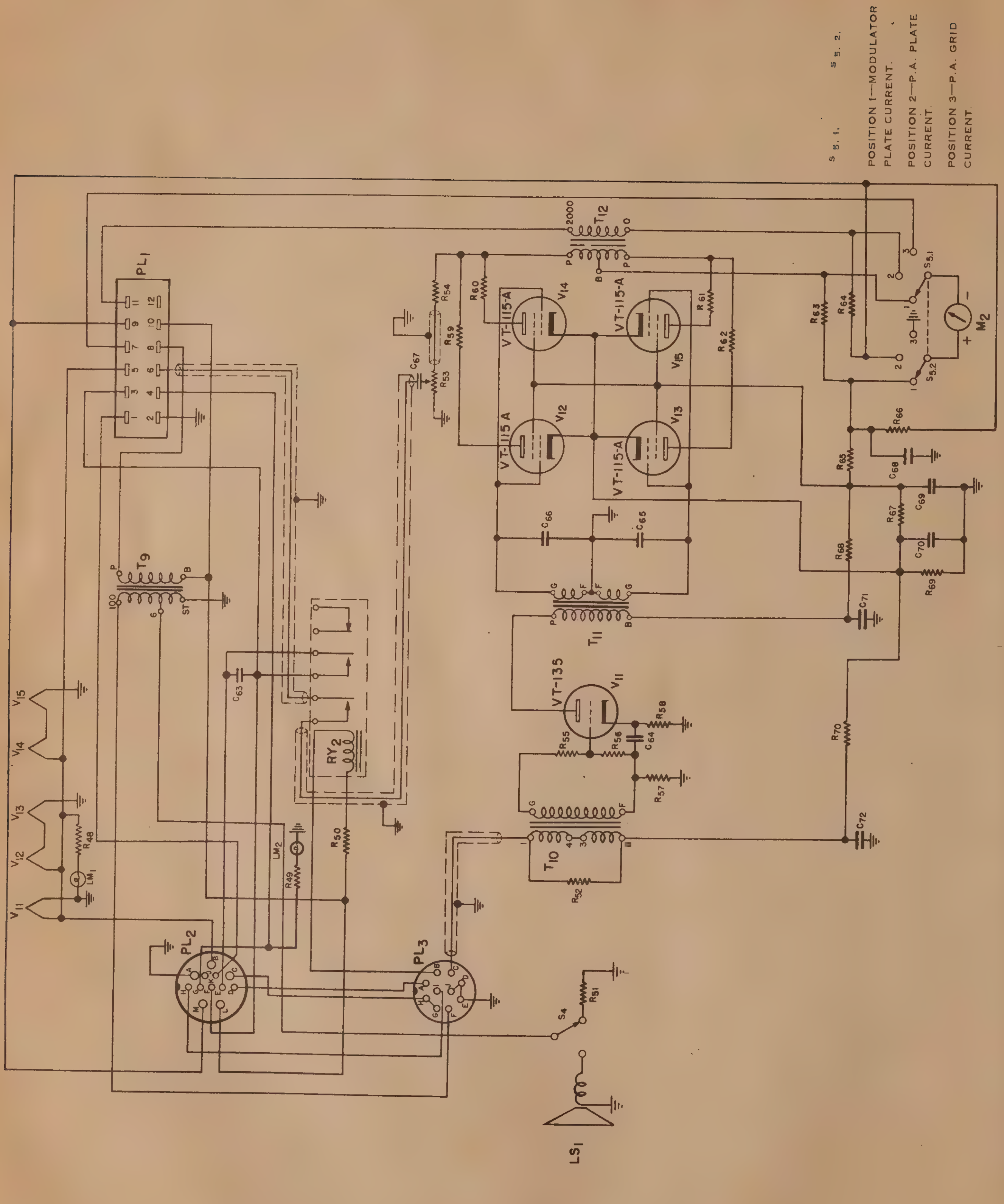


Fig. 20. Radio receiver and transmitter BC-669-B, schematic diagram of modulator section.

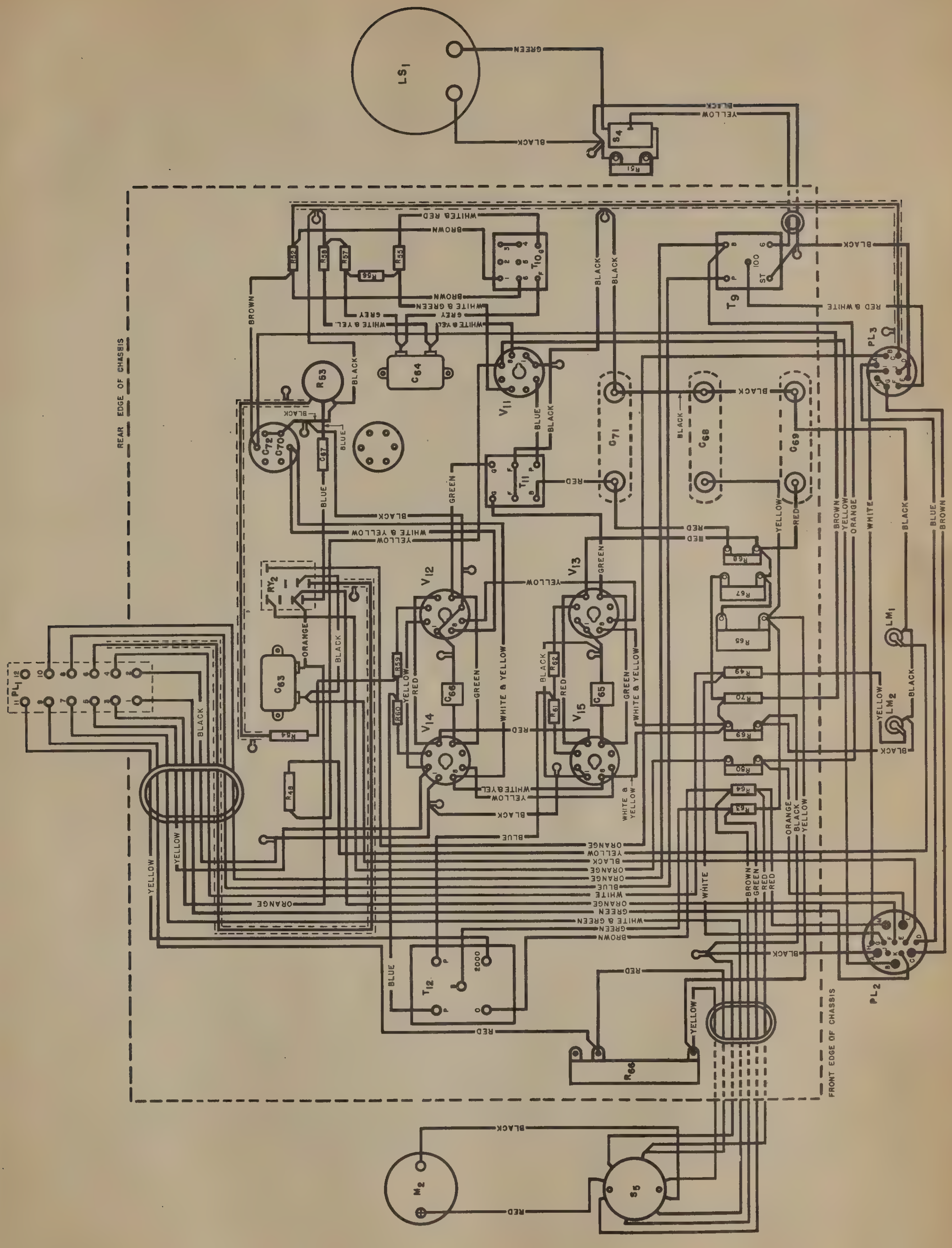


FIG. 21. TRANSMITTER MODULATOR SECTION, PRACTICAL WIRING DIAGRAM.

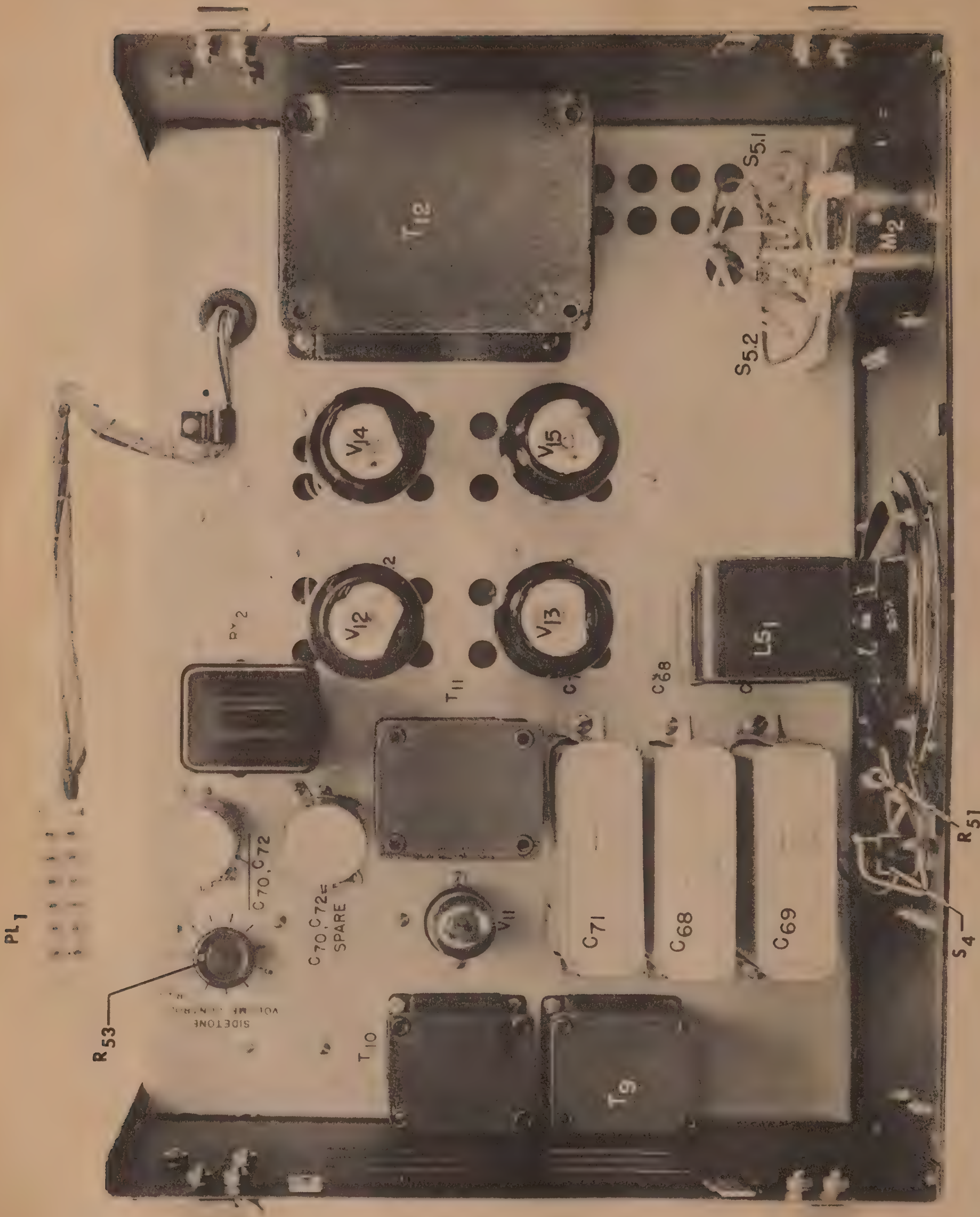


FIG. 22. RADIO RECEIVER AND TRANSMITTER BC-669-B, TOP VIEW OF MODULATOR SECTION.

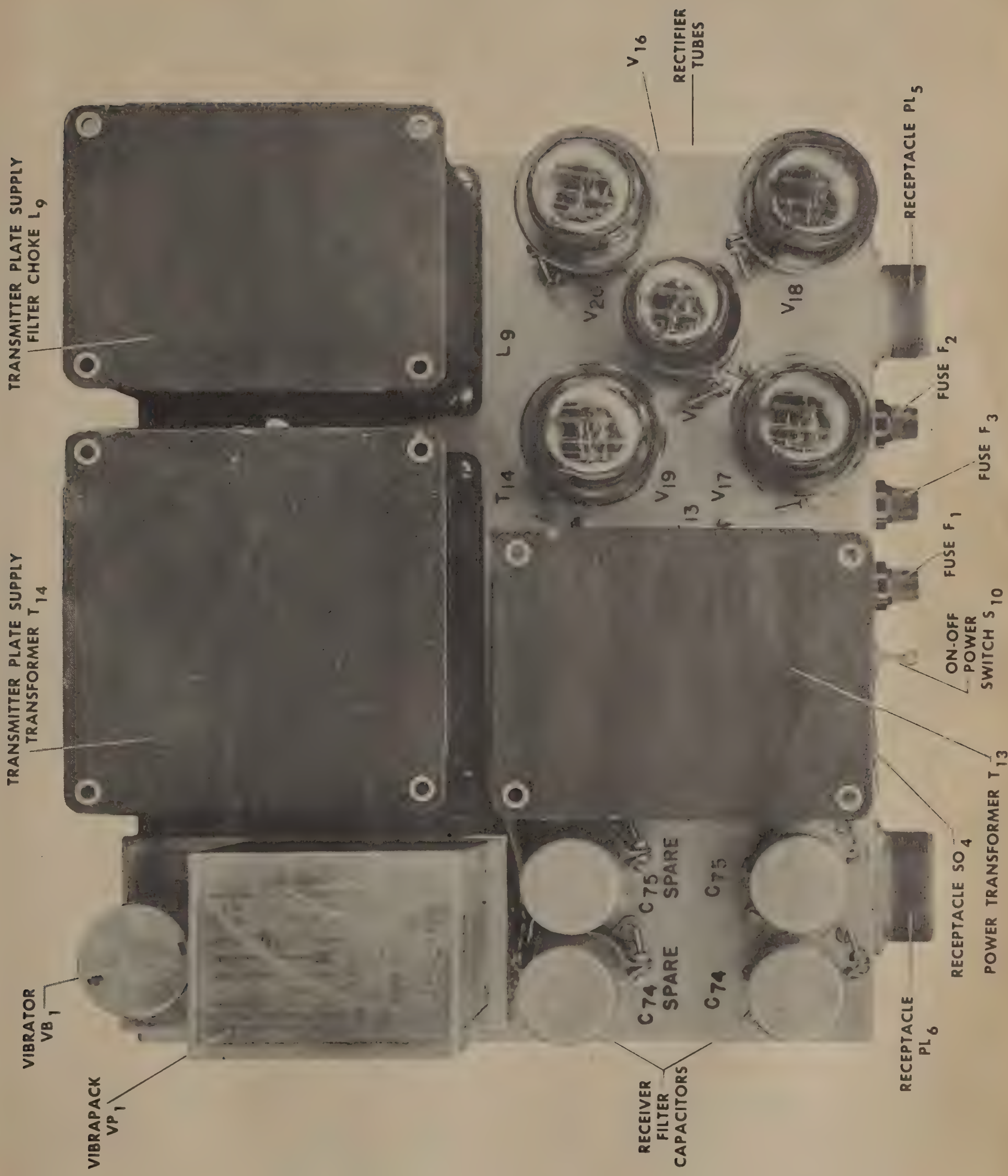


FIG. 23. POWER SUPPLY UNIT PE-110-B, TOP VIEW OF CHASSIS.

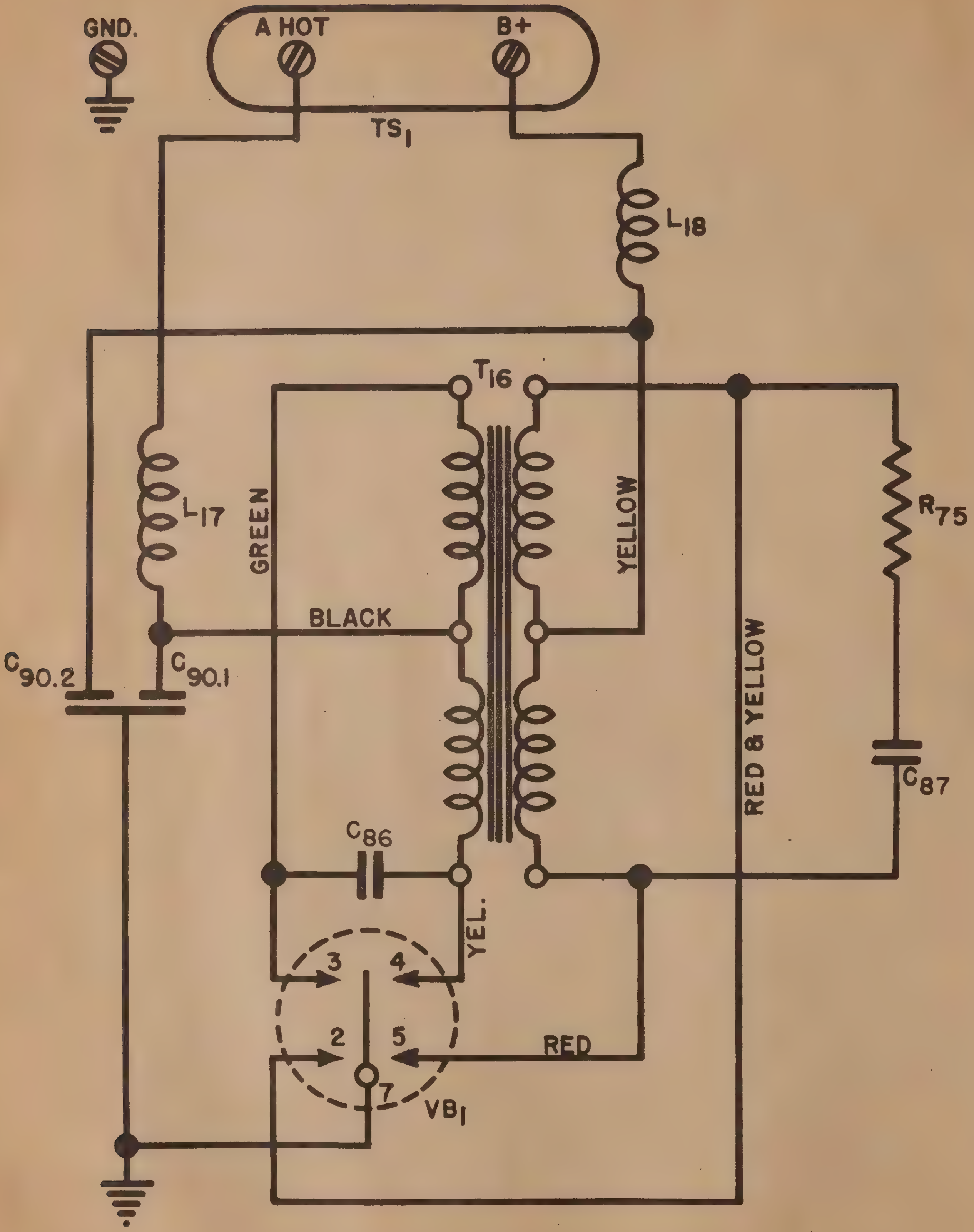
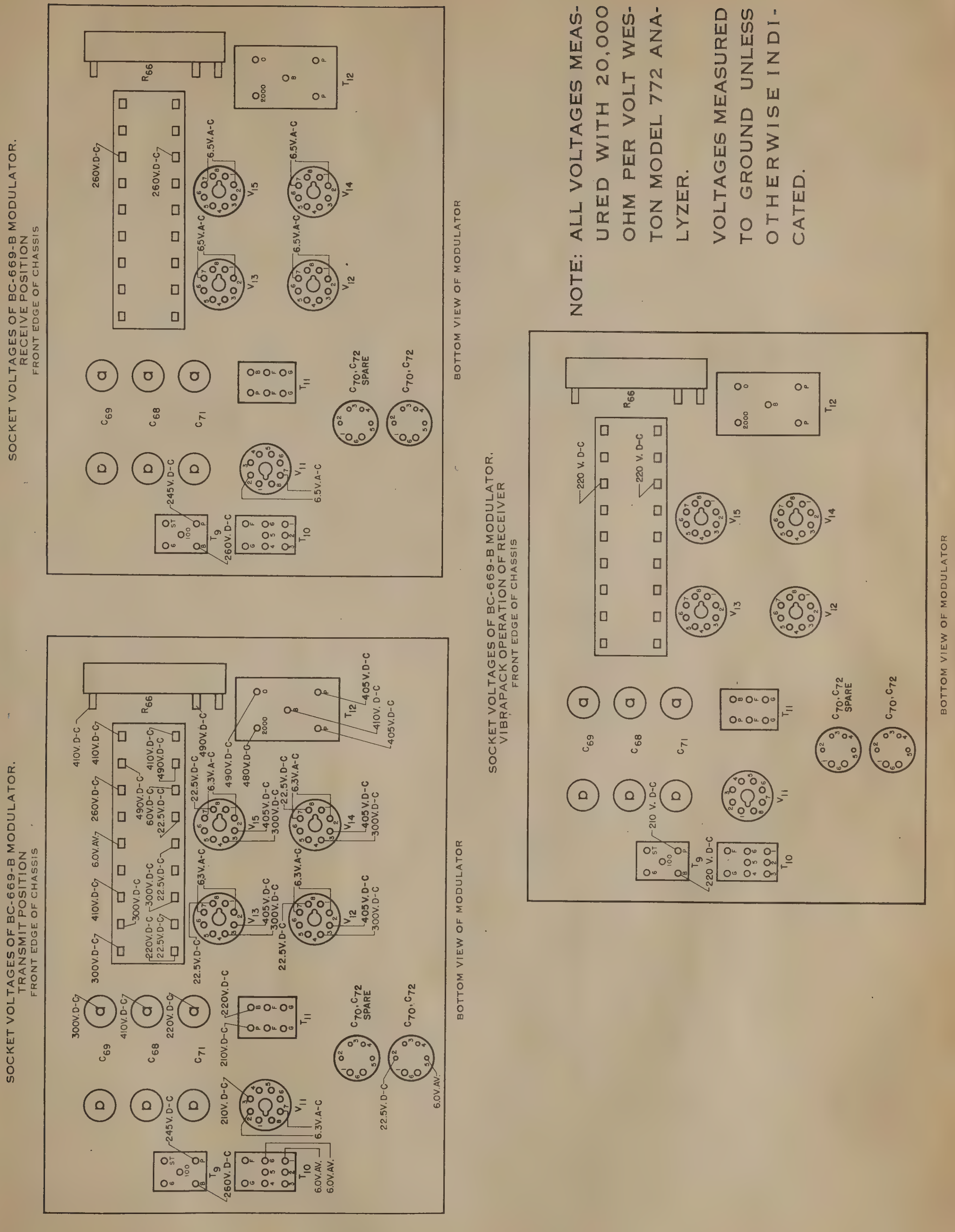


FIG. 24. VIBRAPACK VP$_1$ USED ON POWER SUPPLY UNIT PE-110-B, SCHEMATIC DIAGRAM.



SOCKET VOLTAGES OF BC-669-B MODULATOR.
TRANSMIT POSITION
FRONT EDGE OF CHASSIS

BOTTOM VIEW OF MODULATOR

SOCKET VOLTAGES OF BC-669-B MODULATOR.
RECEIVE POSITION
FRONT EDGE OF CHASSIS

BOTTOM VIEW OF MODULATOR

SOCKET VOLTAGES OF BC-669-B MODULATOR.
VIBRAPACK OPERATION OF RECEIVER
FRONT EDGE OF CHASSIS

BOTTOM VIEW OF MODULATOR

NOTE: ALL VOLTAGES MEASURED WITH 20,000 OHM PER VOLT WESTON MODEL 772 ANALYZER.

VOLTAGES MEASURED TO GROUND UNLESS OTHERWISE INDICATED.

FIG. 25. TRANSMITTER MODULATOR SECTION TUBE SOCKET LAYOUT DIAGRAMS SHOWING VOLTAGES.

(c) Open the door marked ANTENNA LOADING ADJUSTMENT.

Note: The antenna must be connected to the antenna post of the transmitter from here on.

(d) Move the sliding contactor (whose number corresponds to the channel number), on the antenna loading coil approximately half-way up the coil.

(e) Turn the transmitter on by pressing the press-to-talk switch of the handset or microphone.

(f) Turn ANTENNA TUNING knob until the ANTENNA CURRENT meter reads maximum, then release press-to-talk switch. If the reading goes thru a maximum and then dips while the ANTENNA TUNING dial is turned from 0 to 100 on its scale, the antenna tuning is correct when set for the maximum ANTENNA CURRENT meter reading.

(g) If no maximum is reached, move the same antenna loading coil sliding contactor up or down, repeating (e) and (f) until the ANTENNA CURRENT meter goes thru a maximum, then set the dial for this maximum. Caution: Do not be misled by a false maximum caused by passing 0 or 100 on the ANTENNA TUNING dial.

(h) Press the press-to-talk switch for one or two seconds and note the D.C. CURRENT meter reading. This reading should be between 150 ma. and 210 ma. for proper operation of the transmitter.

(i) If the D.C. CURRENT meter indication exceeds 210 ma. move the sliding contactor on the "A" side of the plate tuning coil downward one or two turns at a time, repeating the antenna loading coil adjustment and ANTENNA TUNING knob adjustment as in (e), (f), (g), until the D. C. CURRENT meter reads between 150 ma. and 210 ma.

(j) If the D.C. CURRENT meter reads less than 150 ma., repeat the procedure recommended in (i) but move the sliding contactor on the "A" side of the plate tuning coil upward instead of downward.

(k) When the correct adjustment is reached, the D.C. CURRENT meter will indicate 150 to 210 ma. of plate current and ANTENNA CURRENT meter will indicate 1.2 to 1.5 amperes of antenna current.

(l) Repeat the antenna tuning procedure outlined in (14) for any remaining channels, using in each case the sliding contactors pertinent to the corresponding operating channel numbers.

(15) (a) Now check all the tuning adjustments made in par. 25.d., making slight readjustments where necessary to compensate for any slight misalignment in tuning due to the effects of subsequent circuit adjustments. Caution: Be careful not to locate any of the sliding contactors so that the contacting spring rests between turns as this may short-circuit these turns. Erratic behavior of the transmitter during circuit adjustments indicates improper sliding contactor setting.

(b) Using the 1/2 inch socket wrench provided in the tool box, lock the plate tuning capacitors by tightening the locking nut.

SECTION IV - SUPPLEMENTARY DATA

The supplementary data found on the following pages consists of: table of replaceable parts, and practical wiring diagrams.

26. TABLE OF REPLACEABLE PARTS

RESISTORS

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
R_1	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_2	Resistor	15,000 Ohm ± 20% 1/2 Watt	23BX153F	SPR	SCI-1/2
R_3	Resistor	330 Ohm ± 10% 1/2 Watt	23BX331E	SPR	SCI-1/2
R_4	Potentiometer	10,000 Ohm Potentiometer (Special)	25C087G	CT	35
R_5	Resistor	27,000 Ohm ± 10% 1 Watt	23BW273E	SPR	SI-1
R_6	Resistor	15,000 Ohm ± 20% 1/2 Watt	23BX153F	SPR	SCI-1/2
R_7	Resistor	390 Ohm ± 10% 1/2 Watt	23BX391E	SPR	SCI-1/2
R_8	Resistor	47,000 Ohm ± 20% 1/2 Watt	23BX473F	SPR	SCI-1/2
R_9	Resistor	330 Ohm ± 10% 1/2 Watt	23BX331E	SPR	SCI-1/2
R_{10}	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_{11}	Resistor	1,000 Ohm ± 20% 1/2 Watt	23BX102F	SPR	SCI-1/2
R_{12}	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_{13}	Resistor	330 Ohm ± 10% 1/2 Watt	23BX331E	SPR	SCI-1/2
R_{14}	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_{15}	Resistor	47,000 Ohm ± 20% 1/2 Watt	23BX473F	SPR	SCI-1/2
R_{16}	Resistor	2.2 Megohm ± 20% 1/2 Watt	23BX225F	SPR	SCI-1/2
R_{17}	Resistor	4.7 Megohm ± 20% 1/2 Watt	23BX475F	SPR	SCI-1/2
R_{18}	Resistor	33,000 Ohm ± 20% 1/2 Watt	23BX333F	SPR	SCI-1/2
R_{19}	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_{20}	Resistor	220,000 Ohm ± 20% 1/2 Watt	23BX224F	SPR	SCI-1/2
R_{21}	Potentiometer	500,000 Ohm Potentiometer (Special)	25C086G	CT	35
R_{22}	Resistor	2.2 Megohm ± 20% 1/2 Watt	23BX225F	SPR	SCI-1/2
R_{23}	Resistor	470 Ohm ± 10% 2 Watt	23BV471E	SPR	SI-2
R_{24}	Resistor	470,000 Ohm ± 20% 1/2 Watt	23BX474F	SPR	SCI-1/2
R_{25}	Resistor	10,000 Ohm ± 10% 10 Watt	24BG103E	U	CC
R_{26}	Resistor	47,000 Ohm ± 10% 1 Watt	23BW473E	SPR	SI-1
R_{27}	Resistor	7.5 Ohm ± 10% 10 Watt	24BG075E	U	CC
R_{28}	Resistor	68,000 Ohm ± 10% 1/2 Watt	23BX683E	SPR	SCI-1/2
R_{29}	Resistor	100,000 Ohm ± 20% 1/2 Watt	23BX104F	SPR	SCI-1/2
R_{30}	Resistor	1 Megohm ± 20% 1/2 Watt	23BX105F	SPR	SCI-1/2
R_{31}	Resistor	100,000 Ohm ± 20% 1/2 Watt	23BX104F	SPR	SCI-1/2
R_{32}	Resistor	10,000 Ohm ± 10% 2 Watt	23BV103E	SPR	SI-2
R_{33}	Resistor	1 Megohm ± 20% 2 Watt	23BV105F	SPR	SI-2
R_{34}	Resistor	10 Ohm ± 10% 2 Watt	24BV100E	OC	PF
R_{35}	Resistor	20,000 ± 10% 10 Watt	24BG203E	U	CC

RESISTORS - CONTINUED

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
R_{36}	Resistor	25 Ohm ± 10% 1/2 Watt	24BX250E	OC	PJ
R_{37}	Resistor	10 Ohm ± 10% 2 Watt	24BV100E	OC	PF
R_{38}	Resistor	20,000 ± 10% 10 Watt	24BG203E	U	CC
R_{39}	Resistor	25 Ohm ± 10% 1/2 Watt	24BX250E	OC	PJ
R_{40}	Resistor	50 Ohm ± 10% 10 Watt	24BG500E	U	CC
R_{41}	Resistor	7,000 Ohm ± 10% 2 Watt	23BV702E	SPR	SI-2
R_{42}	Resistor	100 Ohm ± 10% 1/2 Watt	24BX101E	OC	PJ
R_{43}	Resistor	30,000 Ohm ± 10% 10 Watt	24BG303E	U	CC
R_{44}	Resistor	47,000 Ohm ± 10% 1 Watt	23BW473E	SPR	SI-1
R_{45}	Resistor	125 Ohm ± 10% 1/2 Watt	24A812	OC	PJ
R_{46}	Resistor	47,000 Ohm ± 10% 1 Watt	23BW473E	SPR	SI-1
R_{47}	Resistor	15 Ohm ± 10% 10 Watt	24BG150E	U	CC
R_{48}	Resistor	40 Ohm ± 10% 2 Watt	24BV400E	IRC	BW-2
R_{49}	Resistor	40 Ohm ± 10% 2 Watt.	24BV400E	IRC	BW-2
R_{50}	Resistor	25,000 ± 10% 10 Watt	24BG253E	U	CC
				LEC	1-3/4 E
R_{51}	Resistor	6 Ohm ± 10% 10 Watt	24BG060E	U	CC
R_{52}	Resistor	100 Ohm ± 10% 1/2 Watt	24BX101E	IRC	BW-1/2
R_{53}	Potentiometer	100,000 Ohm Potentiometer (Special)	25C079G	CT	35
R_{54}	Resistor	220,000 Ohm ± 10% 1 Watt	23BW224E	SPR	SI-1
				IRC	BT-1
R_{55}	Resistor	100,000 Ohm ± 10% 1/2 Watt	23BX104E	SPR	SCI-1/2
				IRC	BT-1/2
R_{56}	Resistor	50,000 Ohm ± 10% 1/2 Watt	23BX503E	SPR	SCI-1/2
				IRC	BT-1/2
R_{57}	Resistor	250,000 Ohm ± 10% 1/2 Watt	23BX254E	SPR	SCI-1/2
				IRC	BT-1/2
R_{58}	Resistor	1000 Ohm ± 10% 1/2 Watt	23BX102E	SPR	SCI-1/2
				IRC	BT-1/2
R_{59}	Resistor	50 Ohm ± 10% 1/2 Watt	24BX500E	IRC	BW-1/2
R_{60}	Resistor	50 Ohm ± 10% 1/2 Watt	24BX500E	IRC	BW-1/2
R_{61}	Resistor	50 Ohm ± 10% 1/2 Watt	24BX500E	IRC	BW-1/2
R_{62}	Resistor	50 Ohm ± 10% 1/2 Watt	24BX500E	IRC	BW-1/2
R_{63}	Resistor	300 ma. Meter Shunt (Special)	24A811	SM	1315
R_{64}	Resistor	300 ma. Meter Shunt (Special)	24A811	SM	1315
R_{65}	Resistor	5000 Ohm ± 10% 20 Watt	24BH502E	U	EE
R_{66}	Resistor	500 Ohm (Tapped at 400 Ohms) ± 10% 50 Watt (Special)	24A805	U	KK

R_{67}	Resistor	40,000 Ohm ± 10% 20 Watt	24BH403E	U	EE
R_{68}	Resistor	10,000 Ohm ± 10% 10 Watt	24BG103E	LEC U	1-3/4 E CC
R_{69}	Resistor	125 Ohm ± 10% 10 Watt	24A813	LEC U	1-3/4 E CC
R_{70}	Resistor	1000 Ohm ± 10% 2 Watt	24BV102E	IRC	BW-2
R_{71}	Potentiometer	500 Ohm Potentiometer (Special)	25C088G	CT	35
R_{72}	Resistor	20,000 Ohm ± 10% 25 Watt	24A802	0	0218
R_{73}	Resistor	2 Ohm ± 10% 50 Watt Resistor Assey. with Movable Tap & Mtg. Brackets	1B113	— 0	— 0560B
R_{74}	Resistor	1 Ohm ± 10% 20 Watt Resistor Assey. with Adj. Tap & Mtg. Brackets	24A823	0	0360
R_{75}	Resistor	5000 Ohm ± 10% 1/4 Watt	23-009	MA	A-40389

CAPACITORS

$C_{1.1}$ $C_{1.2}$ $C_{1.3}$	Capacitor	Variable Ganged Capacitor (Special)	48B072	OM	664A-3-60
C_2	Capacitor	.006 mf + 10% - 20% 300 W.V. Mica	47A068	CD	1WS
C_3	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_4	Capacitor	.001 mf ± 5% 500 W.V. Silvered Mica	47BS102D	MIC	PW
C_5	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_6	Capacitor	.05 mf - 10% + 20% 400 W.V. Molded Paper	46AL503H	MIC	342-33
C_7	Capacitor	.02 mf - 10% + 20% 400 W.V. Molded Paper	46AF203H	MIC	342-12
C_8	Capacitor	.1 mf - 10% + 20% 400 W.V. Molded Paper	46AL104H	MIC	345-21
C_9	Capacitor	2.5 mmf ± 20% 300 W.V. Mica	47A056	GU	6971
C_{10}	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_{11}	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_{12}	Capacitor	.05 mf - 10% + 20% 400 W.V. Molded Paper	46AL503H	MIC	342-33
C_{13}	Capacitor	.02 mf - 10% + 20% 400 W.V. Molded Paper	46AF203H	MIC	342-12
C_{14}	Capacitor	.02 mf - 10% + 20% 600 W.V. Molded Paper	46AM203H	MIC	345-9
C_{15}	Capacitor	200 mmf ± 5% 500 W.V. Silvered Mica	47BT201D	CD	5R
C_{16}	Capacitor	200 mmf ± 5% 500 W.V. Silvered Mica	47BT201D	CD	5R
C_{17}	Capacitor	.02 mf - 10% + 20% 400 W.V. Molded Paper	46AF203H	MIC	342-12
C_{18}	Capacitor	.02 mf - 10% + 20% 400 W.V. Molded Paper	46AF203H	MIC	342-12
C_{19}	Capacitor	200 mmf ± 5% 500 W.V. Silvered Mica	47BT201D	CD	5R

CAPACITORS - Continued

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
C_{20}	Capacitor	200 mmf ± 5% 500 W.V. Silvered Mica	47BT201D	CD	5R
C_{21}	Capacitor	50 mmf ± 20% 500 W.V. Mica	47BU500FLS	MIC	OXMS
C_{22}	Capacitor	50 mmf ± 20% 500 W.V. Mica	47BU500FLS	MIC	OXMS
C_{23}	Capacitor	.05 mf - 10% + 20% 400 W.V. Molded Paper	46AL503H	MIC	342-33
C_{24}	Capacitor	.1 mf - 10% + 20% 400 W.V. Molded Paper	46AL104H	MIC	345-21
C_{25}	Capacitor	.05 mf - 10% + 20% 600 W.V. Molded Paper	46AM503H	MIC	345-22
C_{26}	Capacitor	.006 mf ± 20% 600 W.V. Molded Paper	46AG602F	MIC	340-24
C_{27}	Capacitor	.007 mf ± 20% 400 W.V. Molded Paper	46AF702F	MIC	342-7
C_{28}	Capacitor	.1 mf — 10% + 20% 400 W.V. Molded Paper	46AL104H	MIC	345-21
C_{29}	Capacitor	.002 mf ± 10% 2500 W.V. Mica	47BZ202ELS	MIC	6
C_{30}	Capacitor	.05 mf - 10% + 20% 600 W.V. Molded Paper	46AM503H	MIC	345-22
C_{31}	Capacitor	.002 mf ± 20% 600 W.V. Molded Paper	46AC202F	MIC	340-17
C_{32}	Capacitor	.05 mf - 10% + 20% 400 W.V. Molded Paper	46AL503H	MIC	342-33
C_{33}	Capacitor	.02 mf - 10% + 20% 600 W.V. Molded Paper	46AM203H	MIC	345-9
C_{34}	Capacitor	25 mmf ± 10% 500 W.V. Silvered Mica	47BT250ES	MIC	PO
C_{35}	Capacitor	380 mmf ± 2% 300 W.V. Silvered Mica	47A043	MIC	PO
C_{36}	Capacitor	100 mmf ± 5% 500 W.V. Silvered Mica	47BU101DLST	MIC	PO
C_{37}	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_{38}	Capacitor	500 mmf ± 2% 500 W.V. Silvered Mica	47BS501B	MIC	PO
C_{39}	Capacitor	6-25 mmf Variable Air	48A109	GU	C972
C_{40}	Capacitor	100 mmf ± 5% 500 W.V. Silvered Mica	47BU101DLST	MIC	PO
C_{41}	Capacitor	.05 mf — 10% + 20% 400 W.V. Molded Paper	46AL503H	MIC	342-33
C_{42}	Capacitor	.0015 mf ± 5% 500 W.V. Silvered Mica	47BS152D	MIC	PW
C_{43}	Capacitor	200 mmf ± 5% 1430 W.V.A.C. Mica	47B001	MIC	3
C_{44}	Capacitor	250 mmf Variable Air	48B079	JO	H-15
C_{45}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{46}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{47}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{48}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{49}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{50}	Capacitor	150 mmf Variable Air	48B078	JO	H-15
C_{51}	Capacitor	70 mmf ± 5% 1140 W.V.A.C. Mica	47B055	MIC	3
				SE	F2L
C_{52}	Capacitor	.002 mf ± 10% 2500 W.V. Mica	47BZ202ELS	MIC	6
C_{53}	Capacitor	.002 mf ± 10% 2500 W.V. Mica	47BZ202ELS	MIC	6
C_{54}	Capacitor	.002 mf ± 10% 2500 W.V. Mica	47BZ202ELS	MIC	6
C_{55}	Capacitor	.002 mf ± 10% 2500 W.V. Mica	47BZ202ELS	MIC	6

C_{56}	Capacitor	.006 mf ± 20% 600 W.V. Molded Paper	46AG602F	MIC	340-24
C_{57}	Capacitor	50 mmf ± 5% 500 W.V. Silvered Mica	47BT500D	MIC	PO
C_{58}	Capacitor	.002 mf ± 20% 600 W.V. Molded Paper	46AC202F	MIC	340-17
C_{59}	Capacitor	.002 mf ± 20% 600 W.V. Molded Paper	46AC202F	MIC	340-17
C_{60}	Capacitor	.006 mf ± 20% 600 W.V. Molded Paper	46AG602F	MIC	340-24
C_{61}	Capacitor	.006 mf ± 20% 600 W.V. Molded Paper	46AG602F	MIC	340-24
C_{62}	Capacitor	50 mmf ± 7½% 500 W.V. Silvered Mica	47A033	MIC	PO
C_{63}	Capacitor	.5 mf 200 W.V. Bathtub	46A004	IC MIC	2BA50 BMM 306-105
C_{64}	Capacitor	.5 mf 200 W.V. Bathtub	46A004	IC MIC	2BA50 BMM 306-105
C_{65}	Capacitor	.002 mf ± 10% 500 W.V. Mica	47BV202ELS	MIC	WXM
C_{66}	Capacitor	.002 mf ± 10% 500 W.V. Mica	47BV202ELS	MIC	WXM
C_{67}	Capacitor	.02 mf - 10% + 20% 600 W.V. Molded Paper	46AM203H	MIC	345-9
C_{68}	Capacitor	8 mf 1000 W.V. Oil Filled	45B025	IC MIC	10SAR800 BMA 324-21
C_{69}	Capacitor	8 mf 1000 W.V. Oil Filled	45B025	IC MIC	10SAR800 BMA 324-21
C_{70} C_{72}	Capacitor	Dual 40 mf 100 W.V. Plug-in	45A027	IC MIC	10E288 938-1
C_{71}	Capacitor	8 mf 1000 W.V. Oil Filled	45B025	IC MIC	10SAR800 BMA 324-21
C_{73}	Capacitor	.5 mf 200 W.V. Bathtub	46A004	IC MIC	2BA50 BMM 306-105
C_{74}	Capacitor	8 mf 600 W.V. Plug-in	45A026	IC MIC	60-B-7 937-1
C_{75}	Capacitor	8 mf 600 W.V. Plug-in	45A026	IC MIC	60-B-7 937-1
C_{76}	Capacitor	8 mf 1000 W.V. Oil Filled	45B025	IC MIC	10SAR800 BMA 324-21
C_{77}	Capacitor	8 mf 1000 W.V. Oil Filled	45B025	IC MIC	10SAR800 BMA 324-21
C_{78}	Capacitor	.5 mf 200 W.V. Metal Case	46A041	FA	X-5476
C_{79}	Capacitor	.05 mf 200 W.V. Tubular Oil	46A044	IC	7909
C_{80}	Capacitor	.19 mf ± 10% Tubular Metal Case	46A014	FM	M-2433
C_{81}	Capacitor	.1 mf - 6% + 14% 300 W.V.A.C. Tubular Oil	46A040	FA	X-5475
C_{82}	Capacitor	.1 mf - 6% + 14% 300 W.V.A.C. Tubular Oil	46A040	FA	X-5475

CAPACITORS - Continued

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
C_{83} C_{84}	Capacitor	Dual .05 mf - 6% + 14% 600 W.V. Bathtub	46A013	IC	7910
C_{85}	Capacitor	.002 mf ± 20% 500 W.V. Mica	47BV202F	CD	1W-5D2
C_{86}	Capacitor	1 mf 50 W.V. Bathtub	46A015	MA	A-42290
C_{87}	Capacitor	.004 mf 1600 W.V. Tubular Paper	46A017	MA	A-144217
C_{88}	Capacitor	.006 mf ± 20% 600 W.V. Molded Paper	46AG602F	MIC	340-24
C_{89}	Capacitor	.05 mf 600 W.V. Bathtub	46A005	IC	6BA05
				MIC	BMM 306-106
$C_{90.1}$	Capacitor	.05 mf 50 W.V. Dual Bathtub	46A016	MA	A-205099
$C_{90.2}$	Capacitor	.1 mf 400 W.V.			
C_{91}	Capacitor	.5 mf + 14% - 6% 400 W.V. Bathtub	46A050	IC	6BA50

MISCELLANEOUS

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
F_1	Fuse	5 Ampere 25 V	39A302	LF	4AG
F_2	Fuse	15 Ampere 25 V	39A308	LF	4AG
F_3	Fuse	5 Ampere 25 V	39A302	LF	4AG
L_1	Reactor	3.3 Henries ± 10% 185 ohms D-C Resistance	56A015	ST	10C15
L_2	R-F Choke	1 mh ± 3% 24.8 Ohms D-C Resistance	51A134	GU	4885
L_3	R-F Coil Assembly	58 Microhry Single Wind. 12 Adj. Taps (Special)	1C007	SWI	3257
L_4	R-F Coil Assembly	132 Microhry Single Wind. 6 Adj. Taps. (Special)	51C448	SWI	3227
L_5	R-F Choke	1 mh ± 3% 24.8 Ohms D-C Resistance	51A134	GU	4885
L_6	R-F Choke	1 mh ± 3% 24.8 Ohms D-C Resistance	51A134	GU	4885
L_7	R-F Choke	1 mh ± 3% 24.8 Ohms D-C Resistance.	51A134	GU	4885
L_8	Reactor	22 Henries 10% .090 ma. 667 Ohms Resistance	56A016	GT	1F116
L_9	Reactor	5.3 Henries 10% .450 A. 50 Ohms D-C Resistance	56A017	GT	1N49
L_{10}	Solenoid	450 T . #21 H.F. Layer Wound 220 V., 250 W.		PG	C-10802-3
L_{11}	Solenoid	175 T. #16 H.F. Layer Wound 110 V. 600 W.		PG	AS-C-10755-7
L_{12}	R-F Choke Assembly	30 T. #15 S.C.E. Wire, Single Layer		PG	AS-C-10804
L_{13}	R-F Choke Assembly	30 T. #15 S.C.E. Wire, Single Layer		PG	AS-C-10804
L_{14}	R-F Choke Assembly	200 mh. at 1000 Cy., 20 Ohms ± 10% D.C. Resistance		PG	A-9568
L_{15}	R-F Choke Assembly	30 T. #15 S.C.E. Wire, Single Layer		PG	AS-C-10804

L_{16}	R.F. Choke	1 mh ± 3%, 24.8 Ohms D.C. Resistance	51A134	GU	4885
L_{17}	R.F. Choke	55 ± 5 Turns #16 Enam. Wire, Bank Wound	53A027	MA	A-42328-1
L_{18}	R.F. Choke	1 mh at 1000 Cy., D.C. Resistance 9.7 Ohms, 2 Pie.	53A028	MA	A-40919-1
LM_1	Socket Assembly	Bayonet Type, with Red Jewel	86A016	DR	#20
LM_1	Lamp	6-8V .250 Ampere, Bayonet Base	39A003	GE	#44
LM_2	Socket Assembly	Bayonet Type with Green Jewel	86A015	DR	#20
LM_2	Lamp	6-8V .250 Ampere, Bayonet Base	39A003	GE	#44
LS_1	Speaker	6 Ohm V.C. 5" Permanent Magnet	85C014	J	PM5LS-B9817
M_1	Ammeter	0-2.5 A. R-F Thermocouple Type in Bakelite Case	82B022	SM	35
M_2	Milliameter	0-15 MA. D.C. Movement, 0-300 ma. D.C. With Ext. Shunt (Special)	82B023	TE SM	0321 25
M_3	Voltmeter	0-150 V. A-C Bakelite Case	82B038	GE	8AW-41
PL_1	Plug	12 Prong Male, Bakelite (Special)	10A003	HJ	1412
PL_2	Socket	12 Terminal, Army-Navy Style "S" Box Mounting (Special)	10BC05	AP	MOD. 3102-28-8P
PL_3	Socket	10 Terminal, Army-Navy Style "S" Box Mounting	6A016	AP	AN-3102-18-1S
PL_4	Plug	6 Terminal, U.S. Army Type PL-106	10A048	AMM	SC-D-1357-J
PL_5	Socket	7 Terminal, Army-Navy Style "P" Box Mounting	10A007	AP	AN-3102-24-2P
PL_6	Socket	12 Terminal, Army-Navy Style "S" Box Mounting (Special)	10A008	AP	MOD. 3102-28-8S
PL_7	Socket	7 Terminal, Army-Navy Style "S" Box Mounting	10-042	AER	AN-3102-24-2S
$S_{1.1}$ $S_{1.2}$ $S_{1.3}$ $S_{1.4}$ $S_{1.5}$ $S_{1.6}$ $S_{1.7}$	Switch Assembly	3 Section Ceramic Wafer (Special)	60B082	OM	24498-H3C
$S_{2.1}$ $S_{2.2}$	Switch	DPST Toggle	60A095	HH	81024-Q
$S_{3.1}$ $S_{3.3}$	Switch Assembly	5 Section Ceramic Wafer (Special)	60C132	OM	24499-H5C

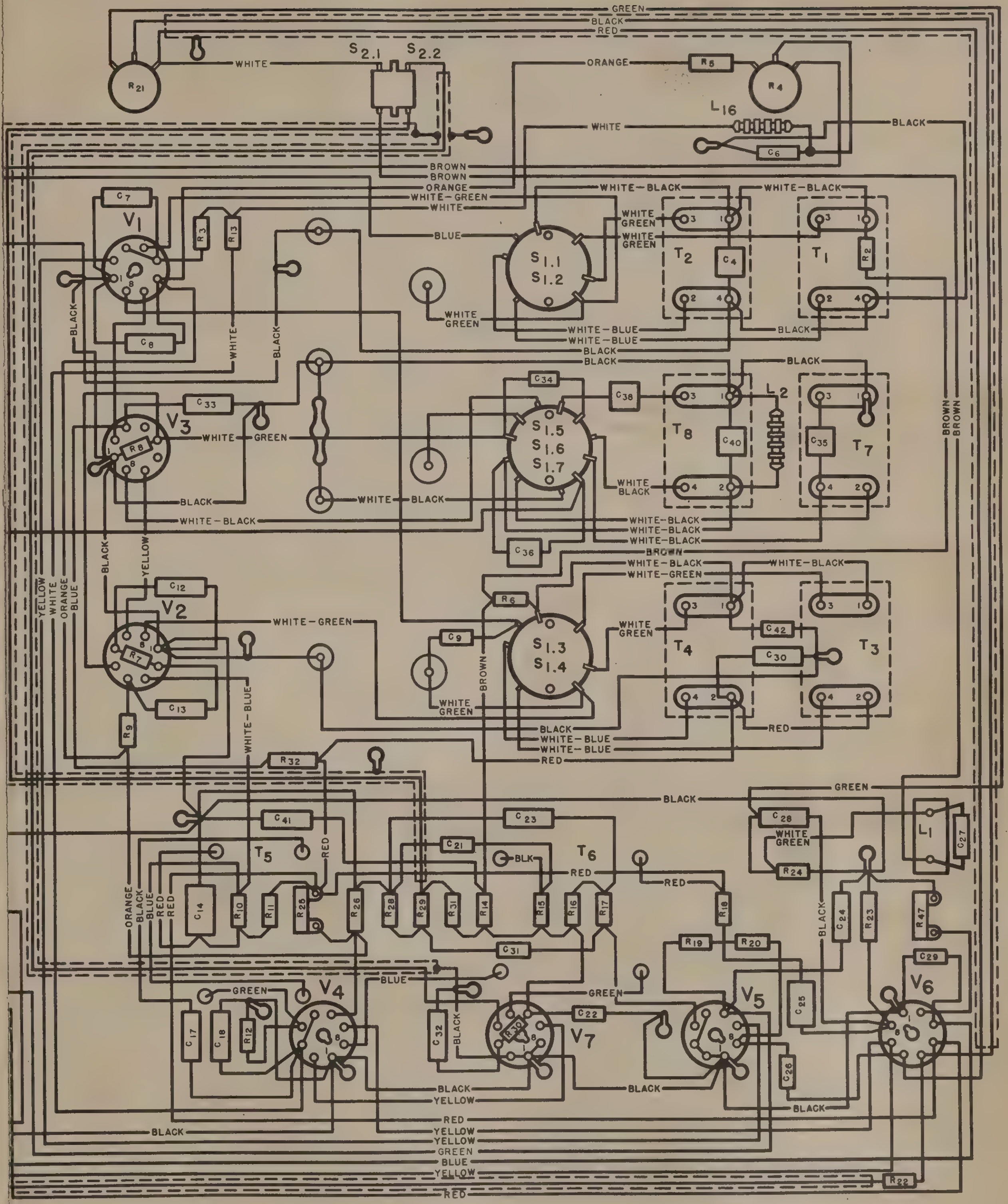
MISCELLANEOUS - Continued

REF. NO.	NAME OF PART	DESCRIPTION	HALLICRAFTER PART NO.	MFR.	MFR. PART NO.
$S_{3.4}$ $S_{3.5}$ $S_{3.6}$ $S_{3.7}$	Switch Assembly	5 Section Ceramic Wafer (Special)	60C132	OM	24499-H5C
$S_{3.2}$	Switch Assembly	Single Section Ceramic (Special)	60B096	OM	5301
S_4	Switch	SPDT Toggle	60A099	HH	
$S_{5.1}$ $S_{5.2}$	Switch	2 Pole 3 Pos. Bakelite Wafer (Special)	60B039	OM	23822-H1
S_6	Switch	SPST Momentary Pushbutton	60A097	RBM	1875
S_7	Switch	SPST Momentary Pushbutton	60A097	RBM	1875
S_8	Switch	SPST Momentary Pushbutton	60A097	RBM	1875
S_9	Switch	DPST Momentary Thumb Lever Type		AMM	SC-D-1055-M
$S_{10.1}$ $S_{10.2}$	Switch	DPST Toggle	60A095	HH	80602
S_{11}	Breaker Point	Stationary Contact Assy. in Magneto	18A021	WMC	C-2455
	Breaker Point	Movable contact Assy. in Magneto	18A022	WMC	C-2436
S_{13}	Switch	SPST Momentary Push Strap Type		FM	
SO_1	Socket	12 Terminal Female, Bakelite, Base Mount	6A007	HJ	1412
SO_2	Socket	6 Terminal, Male, Panel Mounting U.S. Army SO-45	6A022	UL	SC-D-457-1
SO_3	Socket	10 Terminal Male Cord Connector	29A019	AP	AN-3106-18-1P
SO_4	Socket	2 Terminal Female 110 V.A.C.	10A009	AP	MIP-61F
SO_5	Socket	2 Terminal Female, Duplex Convenience outlet	6-052	HB	9200
T_1	Transformer, R. F.	1680 to 2750KC with $C_{1.1}$ Tuning Capacitor (Special)	51C536	GU	4982
T_2	Transformer, R. F.	2700 to 4450 KC with $C_{1.1}$ Tuning Capacitor (Special)	51C537	GU	4983
T_3	Transformer, R. F.	1680 to 2750 KC with $C_{1.2}$ Tuning Capacitor (Special)	51B422	GU	4984
T_4	Transformer, R. F.	2700 to 4450 KC with $C_{1.2}$ Tuning Capacitor (Special)	51B425	GU	4985
T_5	Transformer, I. F.	385 KC Double Permeability Tuned (Special)	50B107	SWI	SW3344
T_6	Transformer, I. F	385 KC Double Permeability Tuned (Special)	50B106	SWI	SW3343
T_7	Transformer, R. F.	2065 to 3135 KC with $C_{1.3}$ Tuning Capacitor (Special)	51B423	GU	4986

T_8	Transformer, R. F.	3085 to 4835 KC with $C_{1.3}$ tuning capicitor (Special)	51B426	GU	4987
T_9	Transformer	Primary to match 7600 ohm single class "A" plate Secondary to match 100 ohm load (Tapped at 6 ohms)	55B046	ST	10A44
T_{10}	Transformer	Primary to match 400 ohm carbon microphone Secondary to match single class "A" grid	55B026	ST	10A7
T_{11}	Transformer	Primary to match single 10,000 ohm class "A" Secondary to match P.P. class "A" grids	55B025	ST	10A6
T_{12}	Transformer	Primary to match P.P. 3500 ohm class "A" plates Secondary to match 2000 ohm final amp. plate	55B024	ST	10A5
T_{13}	Transformer	Primary 115 V. A-C Sec (1) 600 V.C.T. @ .070A. Sec. (2) 13.1 V @ 5 A. Sec. (3) 5 V @ 2 A. Sec. (4) 5 V @ 6 A. Sec. (5) 5 V @ 3 A. Sec. (6) 5 V @ 3 A.	52B047	GT	6K63
T_{14}	Transformer	Primary 115 V. A-C Sec (1) 545 V. @ .455 A	52B048	GT	8K234
T_{15}	Transformer	Magneto armature pri. and sec.		FM	
T_{16}	Transformer	Pri. -12 V @ 3 amp. Sec. 275 V @ 80 ma. potted type	52B057	MA	B-44689-3
TS_1	Terminal Strip	2 Terminal bakelite, screw type (Stamped "A" Hot "B +")	88A099	CN	1720
RY_1	Relay	110 V A-C 60 cy. (DPDT plus one set of normally open contacts	21B047	AE	1004A-1B
RY_2	Relay	6500 ohms D-C. contacts 2 amp. type 1B	21B005	CPC	A3733
RY_3	Relay	110 V. A-C 60 cy. DPDT 1/4" contacts	21B011	GM	12510
RY_4	Relay	110 V. A-C 60 cy. DPDT 1/4" contacts	21B011	GM	12510
RY_5	Relay	12 V. D-C SPST solenoid plunger type	21B019	RBM	2242
RY_6	Relay	12 V. D-C SPST reverse current type	21-045	PG	A-2705
VP_1	Vibrapack	12 V. D-C @ 3 A. input, 275 V. @ 80 ma. output (Special)	27A002	MA	G369
AC_1	AC rings and armature A-C section 115 V. 600 W. generator		20A007	PG	BA60
MT_1	Commutator & armature D-C section 15 V.				
B_1	Battery	12 V. storage, 68 amp,-hr. capacity	27A113	PB	129HSR
SP_1	Spark Plug	18 MM. .025 gap	35A004	GSP	6 Comm.
VB_1	Vibrator	12 V. Mallory plug-in	27A003	MA	G534C

INDEX TO MANUFACTURERS

Symbol	Manufacturer	City
A	Aerovox Corp.	New Bedford, Mass.
AE	Advance Electric Company	Los Angeles, Calif.
AER	Aero Electric Company	Los Angeles, Calif.
AMM	American Microphone Co., Ltd.	Los Angeles, Calif.
AP	American Phenolic Corp.	Chicago, Illinois
CD	Cornell-Dublier Corp.	South Plainfield, N.J.
CH	Cutler-Hammer	Milwaukee, Wisconsin
CN	Cinch Mfg. Corp.	Chicago, Illinois
CPC	C. P. Clare & Company	Chicago, Illinois
CRL	Centralab	Milwaukee, Wisconsin
CSP	Champion Spark Plug	Toledo, Ohio
CT	Chicago Telephone Supply	Elkhart, Indiana
DR	Drake Manufacturing Company	Chicago, Illinois
EA	Electrical Research Labs., Inc.	Evanston, Illinois
EL	Electra Mfg. Co.	Kansas City, Mo.
FA	John E. Fast & Co.	Chicago, Illinois
FM	Fairbanks Morse & Co.	Chicago, Illinois
GE	General Electric Co.	Chicago, Illinois
GM	G-M Laboratories, Inc.	Chicago, Illinois
GS	Gold Shield Products	New York, N. Y.
GT	General Transformer Corp.	Chicago, Illinois
GU	E. I. Guthman Co.	Chicago, Illinois
HA	Hallicrafters Co.	Chicago, Illinois
HB	Harvey Hubbell, Inc.	Bridgeport, Conn.
HH	Hart & Hegeman	Hartford, Conn.
HJ	Howard B. Jones	Chicago, Illinois
IC	Industrial Condenser Corp.	Chicago, Illinois
IRC	International Resistance Co.	Philadelphia, Pa.
J	Jensen Radio Mfg. Co.	Chicago, Illinois
JO	E. F. Johnson Co.	Waseca, Minnesota
LEC	Lectrohm, Inc.	Newark, N. J.
LF	Littlefuse, Inc.	Chicago, Illinois
MA	P. R. Mallory Co.	Indianapolis, Indiana
MIC	Micamold Radio Corp.	Brooklyn, N. Y.
O	Ohmite Mfg. Co.	Chicago, Illinois
OC	The Ohio Carbon Co.	Cleveland, Ohio
OM	Oak Mfg. Co.	Chicago, Illinois
PB	Prest-O-Lite Battery Co., Inc.	Indianapolis, Ind.
PG	Pioneer-Gen-E-Motor Corp.	Chicago, Illinois
RBM	R. B. M. Mfg. Co.	Logansport, Indiana
SI	F. W. Sickles Co.	Springfield, Mass.
SM	Simpson Electric Co.	Chicago, Illinois
SPR	Speer Resistor Corp.	Saint Marys, Pa.
ST	Standard Transformer Corp.	Chicago, Illinois
SWI	S-W Inductor Company	Chicago, Illinois
TE	Triplett Electrical Instrument Co.	Bluffton, Ohio
U	Utah Radio Products Co.	Chicago, Illinois
UL	A. J. Ulmer Company	Philadelphia, Pa.
WB	Willard Storage Battery Co.	Chicago, Illinois
WMC	Wisconsin Motor Corp.	Milwaukee, Wisconsin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S2.1
S2.2
R21
ORANGE
R5
R4
L16
BLACK
C6
BROWN
BROWN
ORANGE
WHITE-GREEN
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WHITE-BLACK
WHITE-BLACK
C7
V1
R3
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S1.1
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R47
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C31
C29
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V4
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C25
V6
C17
C18
R12
C32
BLACK
R30
V7
C22
C26
BLACK
YELLOW
BLACK
BLACK
RED
BLACK
YELLOW
YELLOW
GREEN
BLUE
YELLOW
R22
RED

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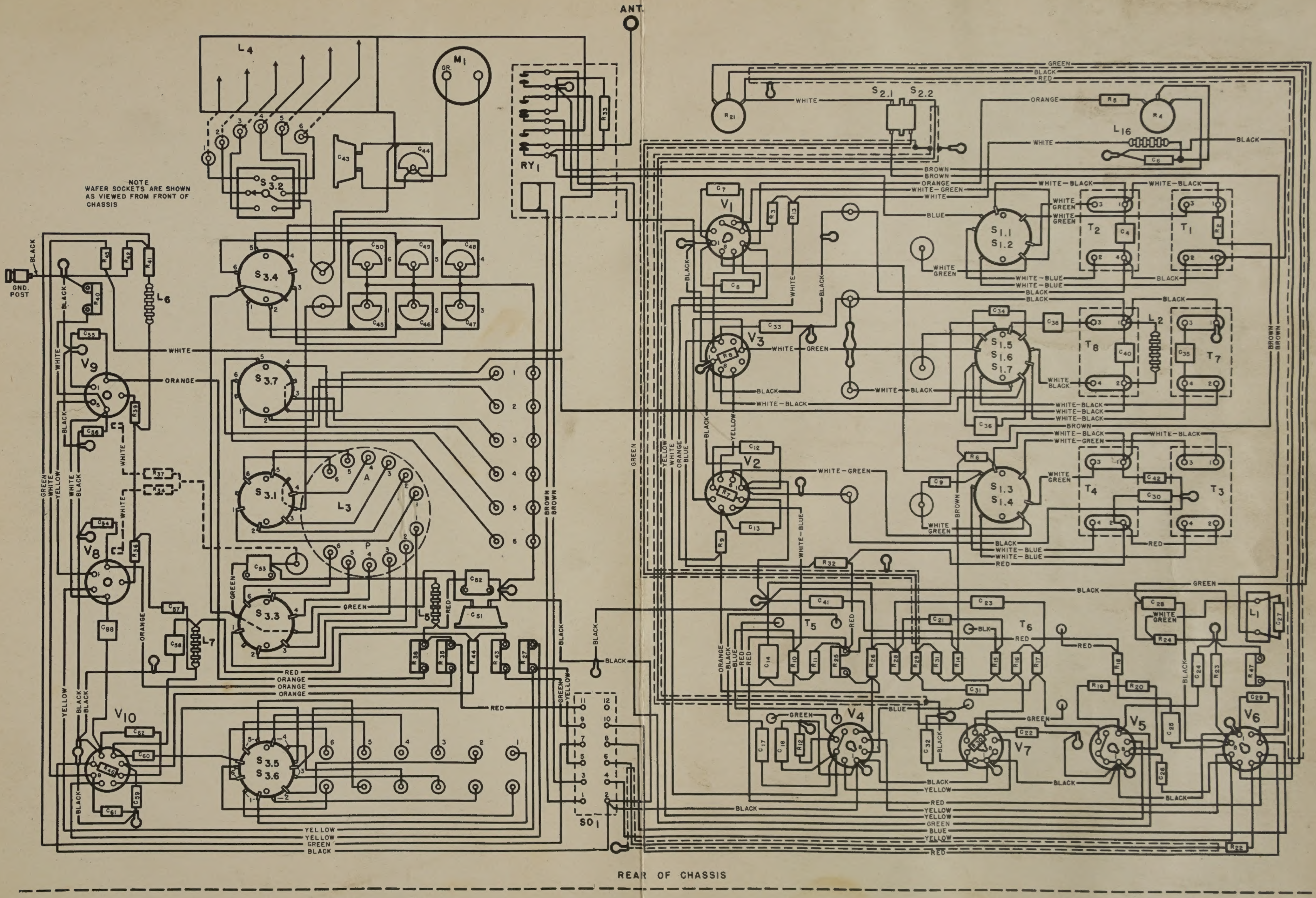

Fig. 27. Transmitter r.f. section and receiver, practical wiring diagram.

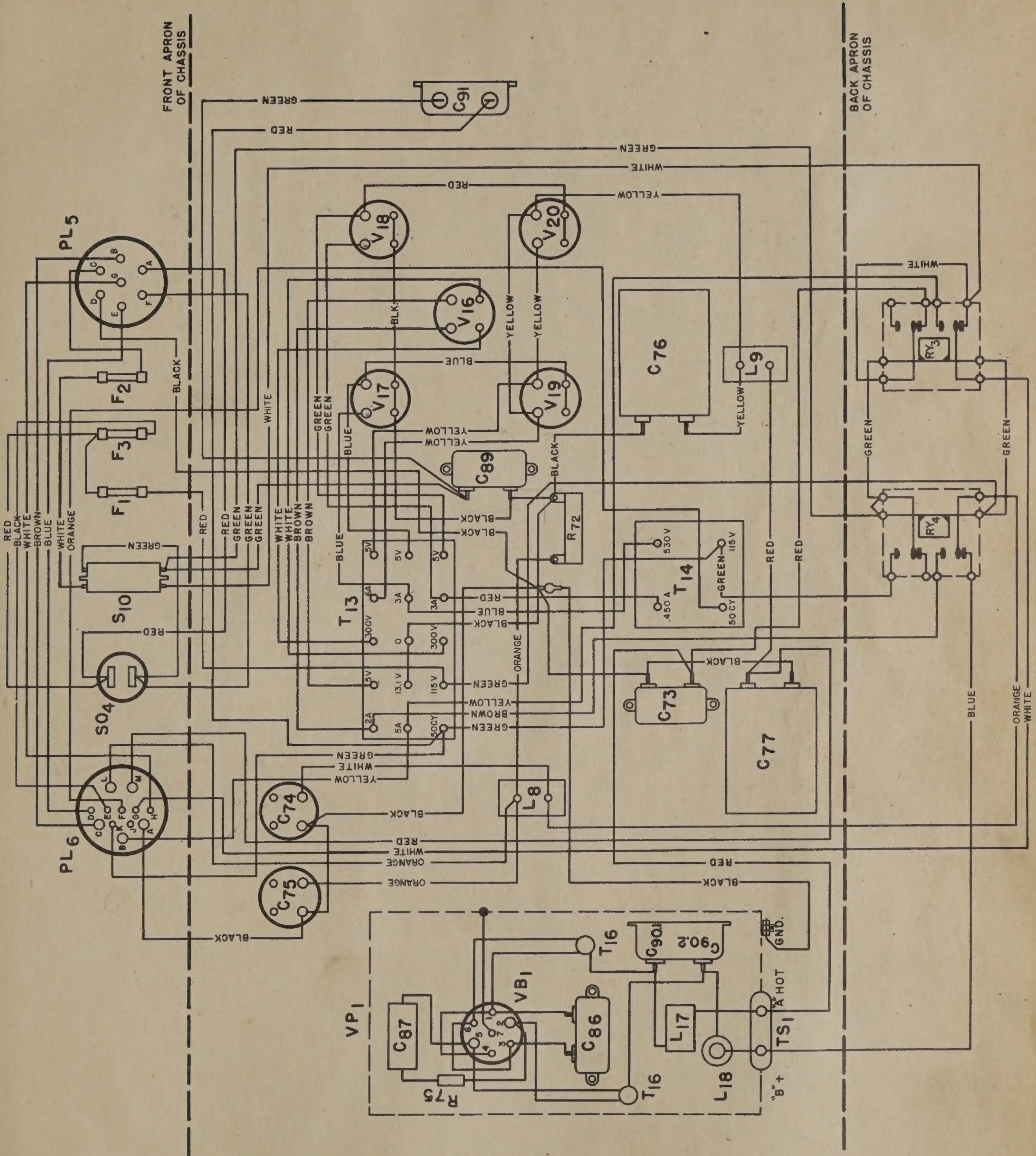

Fig. 26. Power supply unit PE-110-B, practical wiring diagram.